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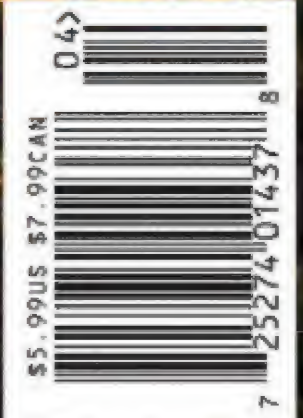
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April 2014 Scenic Travel Wildlife Sports Vol. 30 No. 3



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# Outdoor Photographer

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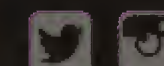


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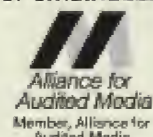
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cover shot



**Photographer:** Marc Adamus

**Location:** Southern Arizona

**Equipment:** Nikon D800E, unspecified 14mm lens

**Situation:** Some scenes are particularly suited to backlight. In Arizona's Kofa National Wildlife Refuge, Marc Adamus made this striking photograph by shooting a long exposure during the period just before and just after the sun emerged over the horizon.

"The image was taken in the Kofa National Wildlife Refuge in southern Arizona. In certain years, wildflowers will bloom here in February and March, and I've revisited this place many times to catch the bloom," Adamus explains. "With sunrise skies overhead lacking much interest, I took note of the directional movement of the clouds and utilized my 10-stop neutral-density filter to capture their motion during the course of a 5-minute exposure. This effect, combined with the sun's appearance about two-thirds of the way through the exposure, yielded the light and effect I was looking for. I used a 14mm lens at a small aperture, and positioned the sun against the hard edge of the rock to intensify the 'star' effect without flaring occurring. The peaks in the background are actually very small, but since I was so close, they appeared impressively large and shapely. My postprocessing consisted of tonal and color work from a single D800E RAW file."

Adamus is a prolific photographer and veteran workshop leader. You can see more of his images and sign up for one of his programs on his website at [www.marcadamus.com](http://www.marcadamus.com).



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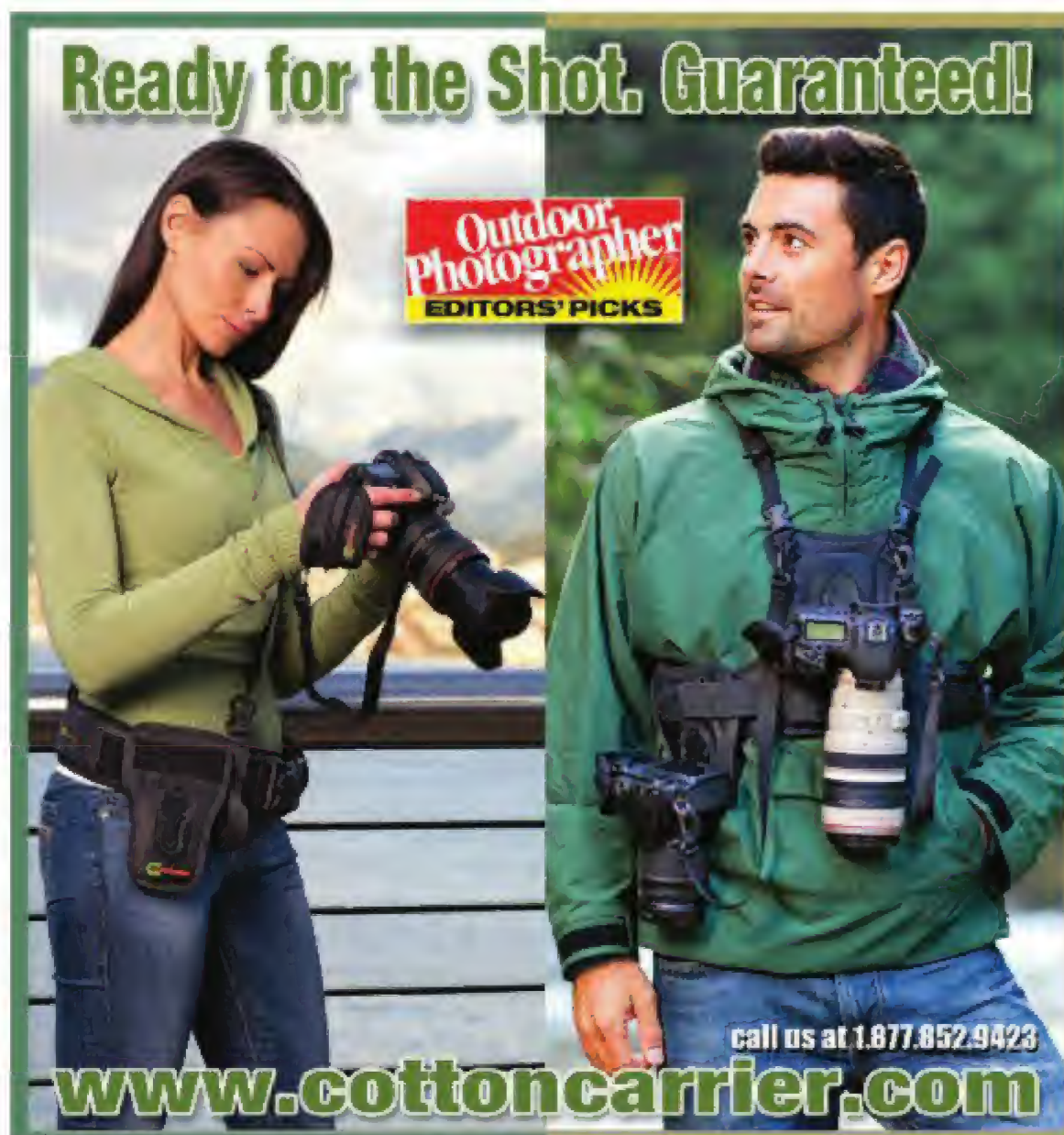


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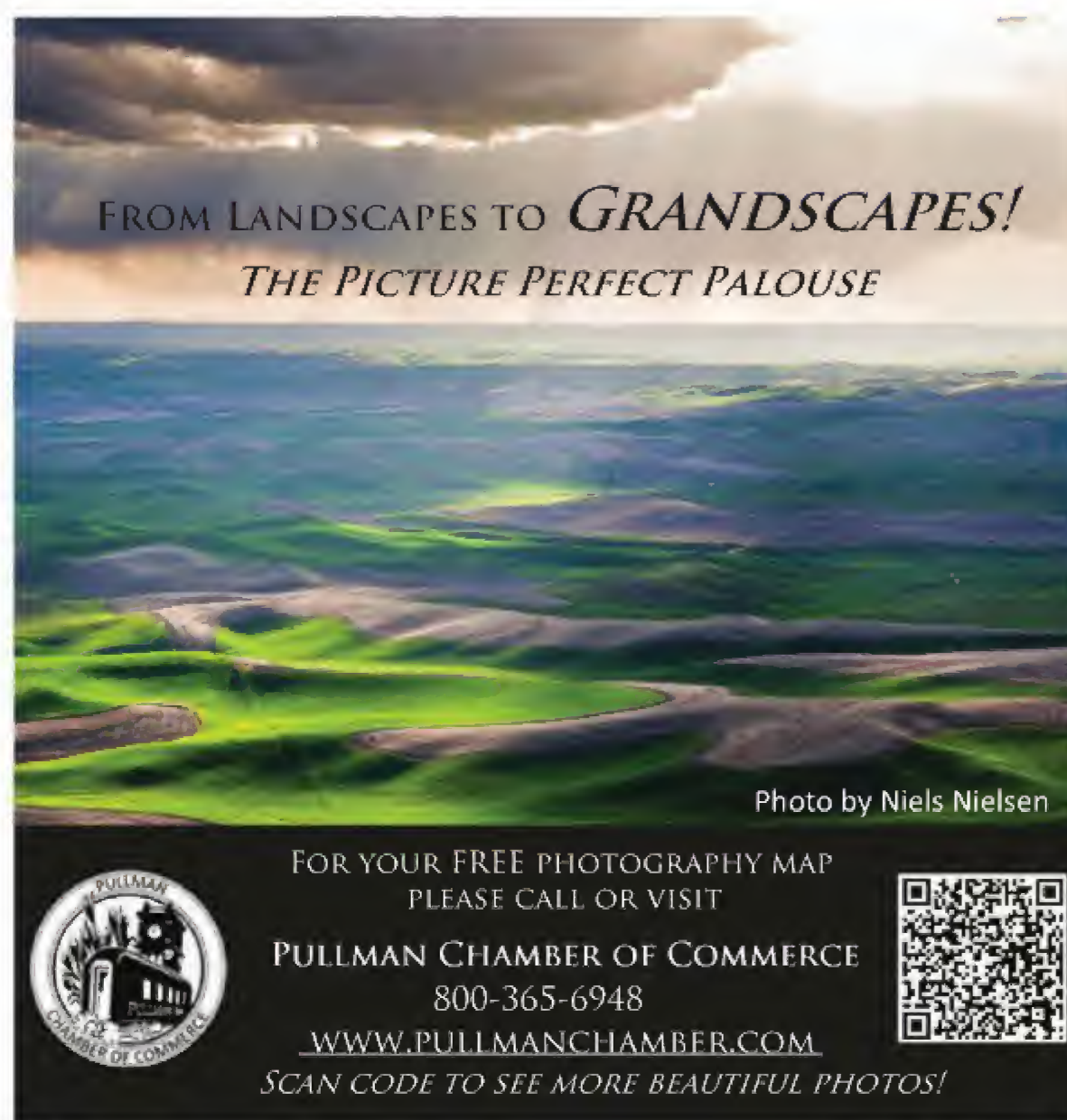




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## in this issue



Dave Welling

Also on the topic of taking a new look at a scene, in this issue, we're running the second in an occasional series on aerial photography with drones. **Eric Cheng** of [skypixel.org](http://skypixel.org) is a pioneer in this kind of work, and he has been using DJI Phantom quadcopters, and lightweight GoPro and Ricoh cameras to get images that simply haven't been possible before.

When I first started working on this magazine, I attended a two-day seminar by *OP* columnists **Dewitt Jones** and **George Lepp**. The first day was Dewitt's program, and it was incredibly inspiring. In his talk, he would show a photo—a very, very good photo—describing the scene when he took the image and what he was seeing at the time. Then he paused and said, "But I wasn't satisfied. I wanted to see how else I could show this scene." A new image came up on the screen, and the audience gasped as they saw the same scene rendered in an even more dynamic composition. Dewitt let it sink in before saying he still wasn't done. The familiar sound of the advancing slide carousel echoed in the auditorium (this was back when slideshows actually were done with 35mm slides) and a new rendition of the same scene was projected to the suitably impressed audience.

I've always remembered that day. The key lesson, of course, was to always keep experimenting and exploring a scene. Digital has made this much easier to do since you're not concerned with the very high cost of film and processing, but for many photographers, there's a tendency to get a shot and then pick up the camera and move on to the next scene. We shoot this obvious

"low-concept" image without asking the question of whether there's something else out there. In the article "The High-Concept Image," **Ian Plant** looks at the same tendency and discusses strategies to find the hidden potential within the scene. Looking for the high-concept image is what separates a good image from one that's at the next level. It's taking a solid B to a truly special A+.

Also on the topic of taking a new look at a scene, in this issue, we're running the second in an occasional series on aerial photography with drones. **Eric Cheng** of [skypixel.org](http://skypixel.org) is a pioneer in this kind of work, and he has been using DJI Phantom quadcopters, and lightweight GoPro and Ricoh cameras to get images that haven't been possible before. The DJI Phantom quadcopter represents disruptive technology. It's a relatively low-cost, easy-to-use, robust tool that opens the possibility of wholly new imagery for enthusiasts. With some practice and precautions, anyone can get a Phantom into the air and start shooting motion and stills. Lawmakers are sorting out the legality of photography from the skies, and there are varying regulations you need to take into account, but it's all workable, and the potential for what you can capture is staggering. It's a brave new world!

Closer to terra firma, there are a number of articles in this issue about choosing and using telephoto lenses. A good telezoom is a mainstay for any nature photographer, but it's easy to get lost in the morass of specs and technology in any modern lens. To help you sort through it, check out "Supertelephoto Zooms," where we go into detail on the most important aspects of long lenses, plus we have a comparison chart that looks at how the currently available models stack up. Then look at **Dave Welling's** "Versatility Of A Telephoto" article to see how you can get more creative with your long focal-length lenses.

We've been making some changes at [outdoorphotographer.com](http://outdoorphotographer.com). On the *OP* Daily Blog, we're increasing the number of feature articles and adding more camera and lens reviews. You can also enter the *OP* Assignments for your chance to get published in the magazine and featured on the website. [outdoorphotographer.com](http://outdoorphotographer.com) has a wealth of archived articles, galleries and online-exclusive features. Check it out and let me know what you think. You can find me on Twitter @OPRobinson or email me at [opeditors@outdoorphotographer.com](mailto:opeditors@outdoorphotographer.com).

—Christopher Robinson, Editor

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# SHOWCASE

## Leaves And Seeds

This image was taken by Elizabeth Carmel in the Wasatch Mountains near Park City, Utah. Carmel goes there in the autumn to photograph Rocky Mountain maples that turn rich shades of red and orange. When the leaves fall, dried fruit pods, white in color, remain on the branches. Says Carmel, "The fruit pods remind me of dogwood blossoms. The juxtaposition of the white fruit pods and the colored autumn leaves creates a wonderful collage of color and texture on the trees. There are many compositions to work with, but I found the best images were with my telephoto lens, where I could show in detail the shapes of the leaves and seed pods against the darker branches." Hasselblad H5D-50, Hasselblad 300mm HC

Elizabeth Carmel

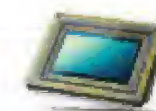
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# SHOW CASE

## Mount Sneffels & Booming Clouds

James Kay captured this image during a five-day trip into the Mount Sneffels Wilderness Area in the San Juan Mountains of Colorado during a very wet July. Huge monsoon thunderstorms would blossom every afternoon, which produced crystal-clear air and dramatic clouds that bubbled up over 14,150-foot Mount Sneffels each day. With all that moisture, the vegetation was electric green, the wildflowers were prolific and the streams were gushing. Blue Lake's cerulean waters are a result of old glacial silt still mixing with this stream before it enters the lake.

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James Kay

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Introduced by the manufacturer as the "Olympus for all," the new **Olympus OM-D E-M10** includes the power and quality of the OM-D E-M1 and E-M5 in an affordable interchangeable-lens system. A 16-megapixel Live MOS sensor and TruePic VII processor, with an ISO range of 100-25,600, are housed in a lightweight metal body with a 1.4K-dot EVF viewfinder, tilting three-inch touch screen and built-in flash. The three-axis stabilization system is similar to the five-axis system found in the E-M5 and E-M1, providing a steady shot even in low light and when using a slow shutter speed. The FAST AF system provides 81 target spots throughout the frame, allowing Small AF Target and Super Spot AF modes to capture specific accurate focus at 8 fps. The E-M10 includes built-in WiFi, which syncs to smart devices using the free Olympus Image Share app for image sharing or remote camera control. List Price: \$699 (body only). **Contact:** Olympus, [www.getolympus.com](http://www.getolympus.com).



## ◀ NIKON D3300

The **D3300** is Nikon's newest entry-level DSLR, delivering pro image quality with a 24.2-megapixel DX (APS-C) CMOS sensor, the latest EXPEED 4 image processing and no OLPF (optical low-pass filter) for maximum sharpness. Normal ISO range is 100-12,800 (expandable to 25,600). The new camera can shoot stills at 5 fps and do 1080 full HD video with full-time AF at 60p. The eye-level pentamirror viewfinder shows about 95% of the actual image area, while the three-inch, 921K-dot LCD monitor shows 100% (in Live View mode). Shutter speeds range from 30 to 1/4000 sec., with X flash sync up to 1/200 sec. (with built-in or optional external flash unit). Images are stored on SD/SDHC/SDXC cards (one slot), and the camera also can take Eye-Fi cards. The optional WU-1a Wireless Mobile Adapter adds WiFi connectivity for instant uploading of images and videos to a smart device (which can be used to operate the D3300 remotely). The camera also is compatible with the optional GP-1A GPS. Dimensions are 4.9x3.9x3.0 inches and 15.1 ounces (body only). List Price: \$649 (with 18-55mm VR II kit zoom). **Contact:** Nikon, [www.nikonusa.com](http://www.nikonusa.com).



## PANASONIC LEICA DG NOCTICRON 42.5mm F/1.2 ASPH POWER OIS ▶

Pushing the aperture range of Micro Four Thirds lenses, **Panasonic** recently announced the **Leica DG Nocticron 42.5mm f/1.2 ASPH Power OIS lens** for the LUMIX G system. With an 85mm equivalent, a portrait go-to, the rugged metal case has 14 lens elements in 11 groups. Two aspherical elements, an extra-low dispersion element and an ultra-high refractive index element ensure sharp images from corner to corner with high contrast without color bleed. Nine blades create a smooth bokeh, and the Power OIS (Optical Image Stabilization) compensates for handheld shake, allowing you to take full advantage of the large aperture range. List Price: \$1,599. **Contact:** Panasonic, [www.shop.panasonic.com](http://www.shop.panasonic.com).



## TRAIL PACK ▶

The **Uinta pack** by **Gura Gear** takes you from the street to the trail. The Cordura and weatherproof ripstop X-Pac bag protects your pro-sized DSLR system using either a Small or Medium Pro Module to customize your gear setup for personalized weight distribution and gear retrieval—either grabbing your gear traditionally from the front or through the quick-access back. The Uinta provides a breathable harness system for added support for long days. An interior padded pocket holds a 17-inch laptop. An additional Tripod & Hydration System accessory can be added to carry a two-liter water bladder and tripod. List Price: \$199 (Uinta); \$69 (Small Pro Module); \$89 (Medium Pro Module); \$39 (Tripod & Hydration System). **Contact:** Gura Gear, [www.guragear.com](http://www.guragear.com).



## ◀ TOUIT 2.8/50 MACRO

For photographers using compact system cameras with an APS-C sensor, **Zeiss** created the **Touit lens line**. Adding to the successful Touit 2.8/12 and Touit 1.8/32 lenses, Zeiss is now offering the **Touit 2.8/50 Macro lens**. Providing a magnification power of 1:1, the lens is incredibly versatile and works well for both detailed macro shots and standard portraits. With a floating element design, including two aspherical elements and two low-dispersion elements, the lens delivers high image quality with reduced chromatic aberration. The round nine-blade iris creates a soft bokeh. Available for E and X mounts in March 2014. List Price: \$999. **Contact:** Zeiss, [www.zeiss.com/photo](http://www.zeiss.com/photo).

## FUJIFILM X-T1 ▶

Waterproof, dustproof and freezeproof up to -14° F, the **Fujifilm X-T1** features a 16.3-megapixel APS-C X-Trans CMOS II sensor and EXR Processor II with phase detection, tracking AF and 8 fps shooting. The OLED 2.36M-dot-resolution electronic viewfinder provides multiple display modes, giving you a choice of how many settings you want to view, including a split mode for precise manual focus. The three-inch LCD has a 1.04-million-dot resolution and is made of tempered glass. Five mechanical dials on the top plate, two command dials and six fully customizable function buttons create personalized in-hand comfort. With built-in WiFi, you can share images and control the camera remotely from your smartphone via the Fujifilm Camera Remote app. List Price: \$1,299 (body only). **Contact:** Fujifilm, [www.fujifilmusa.com](http://www.fujifilmusa.com).





# inFOCUS

## ACRATECH VIDEO BALLHEAD ▶

The aluminum and stainless-steel **Acratech Video Ballhead** provides a sturdy all-in-one tool for making fluid video movements and sharp still photos. Fluid damping maintains smooth pans and tilts, and you can fully adjust the ball tension control for your needs. The oil-less and greaseless ball doesn't attract dirt, and the open frame allows quick and easy cleaning. The video handle is removable, and a 15mm bull's-eye level and laser-engraved dual-degree markings allow for use as a panoramic head or with a long lens. Compatible with Arca-Swiss quick-release plates, the head fits standard 1/4"-20 and 5/16"-16 tripods. Estimated Street Price: \$599. **Contact:** Acratech, [www.acratech.net](http://www.acratech.net).



## ◀ LOCATION POWERSTATION

A convenient energy source in the field, the fan-cooled **Flashpoint Powerstation 800** converts stored lithium energy into sine-wave 120V AC power. Allowing three units to be plugged in at once, the Powerstation provides two switchable modes—one for high-peak strobe generators up to 3000ws and the other for constant low-flow devices like laptops. Three USB ports are also provided for charging small devices. At 7.5 pounds, the main Powerstation 800 can also be run from your car's 12V outlet, or you can swap an interchangeable, 4.85-pound, 12,000mAh Lithium Ion Phosphate battery module to extend your location shoot time. List Price: \$899 (Powerstation 800); \$1,100 (Powerstation 800 Kit); \$350 (Additional Battery). **Contact:** Flashpoint (Adorama), [www.adorama.com](http://www.adorama.com).



## FOCUS 2 ▶

The newly upgraded **Focus 2 Mac app** uses an intuitive layout for making quick and effective image focus and blurring adjustments. Simple sliders allow you to adjust levels for realistic lens blur and tilt-shift effects. Focus 2 now also includes monochrome tools, vignettes and flexible export options, including PSD, TIFF or JPEG, with export directly to Aperture, Photoshop, Lightroom, iPhoto or any other Macphun product, or sent directly to social media. In late February, Macphun shipped **Focus 2 Pro**, which adds plug-in support for Photoshop, Lightroom and Aperture, radial and linear motion blur, and advanced fine-tuning features. List Price: \$12 (Focus 2); \$40 (Pro); \$20 (upgrade). **Contact:** Macphun Software, [www.macphun.com/focus](http://www.macphun.com/focus).



# Nose to Nose with the King of the Arctic



**T**he Polar Bears of Churchill offer one of nature's greatest wildlife photography opportunities. So it's key to choose a polar bear photo tour that gets you **as close as possible** to the bears, while keeping you in **the greatest comfort** in these Arctic environs.

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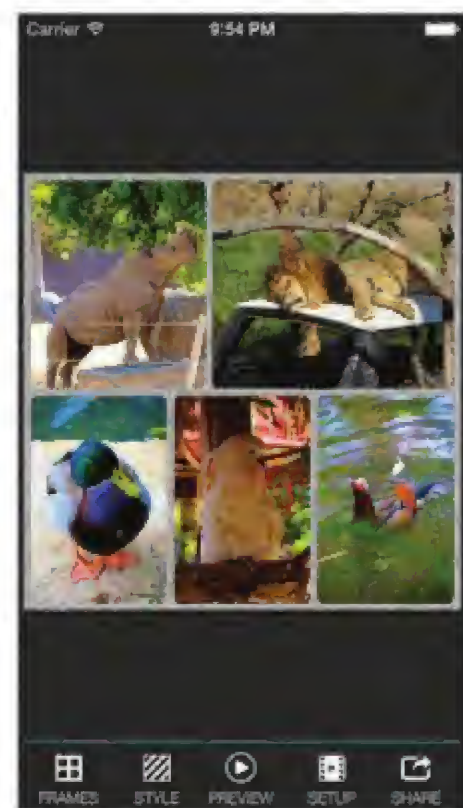
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## APPS FOR NATURE PHOTOGRAPHERS

► **Lapse It** is a full-featured app for making time-lapse and stop-motion videos with your mobile device. There are no restrictions as to capture length or number of frames. You can insert soundtracks, adjust the frame rate, apply effects filters, and adjust focus, white balance and exposure. Projects can be rendered to MP4 and MOV, and uploaded directly to your social networks. The Pro version lets you make videos in resolutions from 240p to 1080p, the free version, only a lower resolution. Lapse It is available native for iOS and Android. List Price: \$1.99 (Pro version); Free (Basic version). **Contact:** Lapse It, [www.lapseit.com](http://www.lapseit.com).



► **PicPlayPost** is an all-in-one app that lets you create multimedia collages from your smartphone combining still photos, video and audio tracks into a single frame. With video, you can add effects to videos and still images, play videos in sequence or simultaneously, choose from 36 fully adjustable frames, and rotate images and video inside frames, among other personalizations. The new iOS 7 version lets you add up to six videos per project (four in iOS 6 and earlier). Once you've finished your collage, share your project on your favorite social-networking site (Instagram, Facebook, YouTube, Tumblr, etc.). List Price: \$1.99. **Contact:** Flambe Studios, [www.flambestudios.com](http://www.flambestudios.com).

► **Sun Seeker** provides a flat-view compass and (in the Pro version) an augmented reality camera (3-D) view showing the sun's path superimposed over the live image, along with its hour intervals, winter and summer solstice paths, rise and set times, plus a map view showing solar direction for each daylight hour. You can choose any date and see the solar path for that day, for any location on Earth. This is a terrific app for planning when to shoot a given subject at a given location: Point your smartphone at the subject, and the app will show you where the sun is relative to it, regardless of clouds, walls or ceilings. It also can provide information about where the sun will be on a different day and time. List Price: \$6.99 (Sun Seeker Pro); Free (Sun Seeker Lite). **Contact:** Ozpda, [www.ozpda.com](http://www.ozpda.com).

► Feel safe in the wild with **Commander Compass**, designed to work where traditional GPS apps fail. The Commander Compass app uses every sensor—GPS, digital compass, gyroscope, accelerometer and more—to turn your iPhone or iPad into a powerful military-spec navigation tool. It includes a milspec compass, a gyrocompass, maps, a GPS tracker, an altimeter, a speedometer, a gyro horizon and an inclinometer. You can see where you are, track the position of any location, track stars, the sun and moon in real time, and use street, satellite or hybrid maps—even find your vehicle when you get back from the field. List Price: \$3.99; Free (Commander Compass Lite). **Contact:** Happymagenta, [www.happymagenta.com](http://www.happymagenta.com).



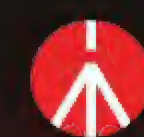
## 360° VIDEO ▼

With its production supported through Kickstarter, the robotic **Galileo platform** by **Motrr** has now come to life. Once your iPhone is connected to the device, the continuous 360° pan and tilt ability makes it possible to create interesting video shots with a small footprint and tiny budget. Compatible with a variety of apps, you can shoot multi-exposure panoramas, time-lapse sequences with panning and multi-cam live editing, or use an iPhone or iPod touch as a remote to control the movement on the fly through Bluetooth technology. The Galileo has a 1/4-inch tripod mount for stable use anywhere. List Price: \$149. **Contact:** Motrr, [motrr.com](http://motrr.com).



## OLIGHT BATON ►

For finding gear in your bag, maneuvering dark spaces or light-painting a composition, a flashlight can be an outdoor photographer's best friend. The pocket-sized, 3.4-inch **S15 Baton** by **Olight USA** uses a CREE XM-L2 LED light and offers four different power settings from 0.5-280 lumens, as well as a strobe setting. The anodized, aircraft-grade aluminum body includes a pocket clip and magnet for hands-free use. A single AA battery provides 15 days of run time. Reverse polarity protection ensures you won't install the battery improperly, even in the dark. Estimated Street Price: \$39. **Contact:** Olight USA, [www.olightusa.com](http://www.olightusa.com).

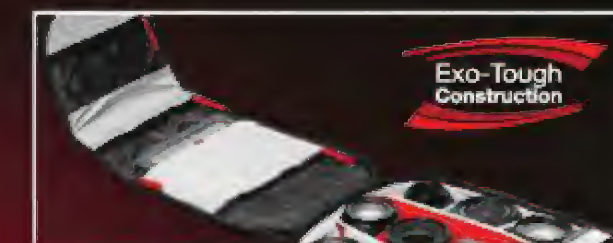


## Manfrotto Introducing the new Pro Bags



### CPS - Camera Protection System

The center of a camera bag is its most vulnerable spot. Manfrotto's CPS provides a thick layer of structured, shock-absorbing core section dividers that safely cushions the equipment you keep at the heart of your Professional bag.



### Exo-Tough Construction

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## Professional Bags

The Manfrotto Pro Collection includes 14 SKUs offering a complete range of bag types suitable for different applications and situations, each in a variety of sizes.



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## Stacks Of Blooms

Images In Bloom • Pictures By Number • Going Long And Light  
Cloudy With A Chance Of Storage

[ By George D. Lepp With Kathryn Vincent Lepp ]



If a foreground object, such as a flowering bush, obstructs the distant background, the blooming effect may occur: The foreground object becomes out of focus, obscuring and inhibiting sharp capture of the background behind it. Since chopping down the bush after it's photographed is *not* an option for responsible nature photographers, the best options are to work around the problem. Use a fairly small *f*-stop (*f*/16) so that the foreground object doesn't go completely out of focus when photographing the background. Another

*LEFT: A finished, retouched, focus-stacked image of a tulip bed in Butchart Gardens, British Columbia, reveals tack-sharp detail from the closest blossom to the back row. Nine images were captured with a Canon EOS 5D Mark III and EF 180mm macro lens, 1/250 sec. at f/11, ISO 200, and composited using Zerene Stacker software. BELOW: A small section of the unretouched foreground shows out-of-focus "blooming" edging the foreground flower. After retouching in Zerene Stacker and minor cloning in Photoshop CC, the problem was resolved.*



### Images In Bloom

**Q** I'm using focus-stacking techniques for my macro images and often I get a halo around some sharp parts of the image. Is there a way to prevent this from happening, or at least dealing with it later in my software?

G. Montgomery  
Atlanta, Georgia

**A** Focus-stacking is a technique that expands depth of field in an image. To accomplish it, the photographer frames the image, then captures a series of in-focus slices, moving through the subject and refocusing from foreground to background. When composited in focus-stacking software, only sharp areas are retained, yielding an image that's sharp from foreground to background.

One of the challenges posed by focus-stacking captures is that when an object close to the camera is rendered out of focus, it blooms—that is, as it gets fuzzy, the image gets larger. As they grow, foreground elements can interfere with efforts to attain sharp captures of background areas. This effect is emphasized when using a longer focal-length lens or when trying to focus-stack a relatively large area, and can be exacerbated by significant tonal differences between the foreground and background.

For landscape photography, we use focus stacking in situations where there are important subjects in both foreground and background. Think, for example, of a field of spring wildflowers stretching to a backdrop of snow-covered mountains. To tell the whole story, we want both the flowers and the mountains tack-sharp.

### MORE On The Web

OP columns are available as an archive online at [www.outdoorphotographer.com/columns](http://www.outdoorphotographer.com/columns). Find tips, answers and advice from OP's trusted stable of world-famous nature photographers!

choice is to change your perspective; position the foreground subject more into the lower aspect of the composition so that it doesn't intrude into the mountain's space.

When focus-stacking captures in macro photography, the possibility of blooming is greater. Although the size of the subject may be very small, the range of focus between front objects and elements at the back of the composition can be large at high magnification. So when photographing the throat of a flower, for example, the nearest parts, the tips of the stamens and stigma, may bloom out of focus and hide portions of the flower's base as it's being photographed. These problems can be solved in post-capture software featuring retouching. Two programs I use that offer this function are Helicon Focus ([www.heliconsoft.com](http://www.heliconsoft.com)) and

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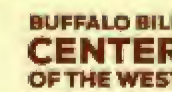
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Zerene Stacker ([www.zerenesystems.com](http://www.zerenesystems.com)). Once the image is composited, areas of sharp focus can be cloned from individual captures to the final composite; in some cases, the cloning required might be quite detailed and take some practice to accomplish well.

### Pictures By Number

**Q** When running two or more cameras, how do you set the numbering system on each camera so that duplicate file names aren't assigned when downloading?

B. Patterson  
Via email

**A** I've had this problem, where two cameras generated the same image file names—and even duplicates from the same camera! It's a nightmare for file management and possibly a risk for inadvertent loss of your images. Truth is, file management diligence begins before capture by understanding how your camera assigns names.

In continuous numbering mode, the camera establishes a folder, beginning with 100, within which captures are numbered consecutively from 0001 to 9999 and then starts over with a new folder (101). The numbering sequence continues as memory cards are inserted, removed and reinserted. In this mode, identical file names will be generated from one camera to another.

However, in Auto Reset mode, the numbering sequence is rebooted each time a newly formatted card is inserted. This means that from one card to the next, identical sets of file names will be generated. I don't recommend this option.

Some DSLRs, such as my Canon EOS 5D Mark III, offer the option of changing the alpha prefix the camera generates. For example, I've set my Canon EOS 5D Mark III to name files with the first four characters MK3\_, followed by the 4-digit file number. Some of my colleagues' Nikons have an in-camera renaming capability also; you'll have to find that old instruction book and figure out how to set yours.

No matter what the camera-generated file name may be, best workflow demands that you rename your image files in accordance with your own file plan, with a date, location or subject code, either before you begin to edit, or immediately after, as you save the files.

### Going Long And Light

**Q** I'm headed to Bhutan for a number of months to work as a volunteer, and I must travel light and with minimum gear. I still want to record what's going on. What are my options for cameras and storage? Should I take many cards or backup drives?

K. Moore  
Via email

**A** This question comes up often; when we travel to a new and remote location, it's difficult to anticipate what photographic equipment will be needed and even harder to leave some of our favorite stuff behind. Fortunately, in today's age of small, but capable digital cameras, there are a lot of options for traveling light.

In order to carry minimal equipment, meaning no extra lenses or accessories, I would suggest one of the compact, all-inclusive cameras that have a wide range of focal lengths, built-in flash, close-focus capability, and are relatively small and light. A few suggestions (but not all that are available) are the Nikon Coolpix P520 and L830; Canon PowerShot SX50 HS and SX510 HS;

In order to carry minimal equipment, meaning no extra lenses or accessories, I would suggest one of the compact, all-inclusive cameras that have a wide range of focal lengths, built-in flash, close-focus capability, and are relatively small and light.

Pentax X-5; Sony Cyber-shot HX50V and HX300; Panasonic Lumix FZ70K and ZS35. At less than \$450, these cameras have extended zoom capabilities with image stabilization to reach out—some as far as 1200mm. They also capture HD video, as sometimes video tells the story best. Keep in mind that video files do take up more storage space.

Figure out how many cards you might need, and then take more. These cameras use SD cards that are very small and relatively inexpensive, so they're easy to transport, but also easy to lose. Purchase the cards in 32 GB form so you can take lots of images in JPEG format at the best resolution; you want the highest-quality images you can get. The end results will make excellent prints for a wall display and are more than adequate for sharing on social media. If you're taking a laptop along, you can save the images on that hard drive as they won't take a lot of space. I strongly recommend using a small backup drive, as well; you can purchase a very small USB-powered hard drive

(runs off the laptop) that will hold up to 500 GB for less than \$100. If a laptop won't be available, you can take a self-powered hard drive, such as the Sanho HyperDrive COLORSPACE; it's made for storing images and even has a small LCD screen to check the images. Power may be an issue so make sure you have the right power adapters for the country and that you have at least two extra batteries for the camera.

### Cloudy With A Chance Of Storage

**Q** With ever-increasing image file sizes, I'm rapidly filling multi-terabyte external drives. Has the time come to use storage and backup services in the cloud?

L. Caine  
Golden, Colorado

**A** We used to have stacks of little yellow boxes filled with slides everywhere; now we have stacks of hard drives, and we keep outgrowing them. Time-lapses, videos and high-res composites yield very large files, so storage is a constant concern. You know I'm an early adopter for most technology, but

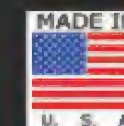
I'm not ready to turn my files over to a third party yet—even if its name were more substantial than “the cloud”—because my images are just too important to me to relinquish control in that way.

My routine, tedious as it may sound, is to keep my digital images on three sets of hard drives. There's an active set at my desk (five 4 TB drives) that's constantly being backed up to a second set at my desk. There's a third set in the safe deposit box at the bank. Once a month or so, I switch the backup set with the bank set. I'm pretty much constantly scrapping and upgrading the hard drives, weeding out and replacing the older, lower-capacity equipment on a regular basis. So, for me, the basic elements of safe image storage haven't really changed that much from the film days. It still requires organization, regular filing, and bigger and safer “file cabinets.” **OP**

Follow **George Lepp's** exploits, see his latest photographs and be part of the discussion on his Facebook page at [www.facebook.com/georgelepp](http://www.facebook.com/georgelepp).

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### KATANA 2 Gimbal Head

The Katana gimbal head is a solid and precision built equipment. Allows you to take effortless control over your heaviest telephoto lenses, smoothly tracking birds in flight or as a solid platform for panoramas.

- Smooth panning and tight locking mechanism.
- Arca compatible lens mount.
- Deep groove ball bearings, sealed; maintenance free.
- Over sized knobs.
- Anodized scratch resistant finish.



*"I had my 1st Katana shoot yesterday. Wow - what a difference! I could frame targets much quicker, especially those I saw at the last second. Yes I could leave the lens lined up on a static target (like herons stood on the nest) waiting for action with the pan and tilt not locked. If a flying bird appeared I could then change targets very quickly. Yes because I could follow changes of course much more easily."*

Reviewed by: Ron from United Kingdom,,

### TOMAHAWK Gimbal Head

The Tomahawk gimbal head allows you to convert your ball head into a gimbal head. It is a more compact and lighter alternative to the big brother Katana gimbal head but still a monster product. It's unique mounting base consists of two mounting surfaces with Arca-Style rails or 1/4"-20 threads at a 90 degree angle so that it can be mounted on the side or top of ball head for ultimate flexibility.

- Smooth panning and tight locking mechanism.
- Arca compatible lens mount.
- Deep groove ball bearings, sealed; maintenance free.
- Anodized scratch resistant finish.
- Lightweight, 2 pounds.



*"I just received my Tomahawk a few days ago. I was immediately impressed by the fact that the unit far exceeded my expectations as to looks and design, it's very sturdy and relatively light weight. I took it out and put it through its paces and, indeed, it operates with a smoothness that is amazing!"*

Reviewed by: Pete B. from Dublin, California,,

[www.promediagear.com](http://www.promediagear.com)



# OLYMPUS OM-D E-M10

THE SMALL CAMERA THAT CAN GET THE BIG PICTURE



*"The first time I picked up an OM-D and shot with it, I knew I was holding the future of photography." —Olympus Trailblazer Jamie MacDonald*

Olympus launched a revolution with the OM-D E-M5 and OM-D E-M1 interchangeable-lens cameras. Now, the new ultra-slim, compact OM-D E-M10 is poised to continue that legacy. A high-resolution 16-megapixel Live MOS sensor, TruePic VII image processor and M.ZUIKO lens compatibility combine to give you crisp, rich-toned, sharp photographs across the full range of lighting conditions.

## High-Resolution 16-Megapixel Live MOS Image Sensor

At the heart of the new OM-D E-M10 is a 16-megapixel Micro Four Thirds Live MOS sensor. The high-resolution image sensor is the same as the one Olympus uses in the OM-D E-M5 camera. With a maximum ISO of 25,600, the OM-D E-M10 will give you excellent detail and color reproduction with smooth tonal gradations in dimly lit situations, and in bright conditions, you can select ISO 100 for expanded low-sensitivity shooting. This is particularly useful for shooting at maximum aperture for thin depth of field and beautiful bokeh effects.

## TruePic™ VII Image Processor

The high-resolution image sensor works with the camera's TruePic VII image processor—which is inherited from the flagship Olympus OM-D E-M1—to generate highly detailed, rich-looking photographs. The image processor has Olympus' Fine Detail Processing II technology, which maximizes lens performance by optimizing optical properties of the attached lens. The image processor works with the lens to enhance its strengths.

## Two New M.ZUIKO Lenses

The super-slim M.ZUIKO DIGITAL 14-42mm f3.5-5.6 EZ pancake zoom lens measures just .9 inches thick. It has a smooth electric zoom that's suitable for shooting movies, and can also be zoomed in and out remotely using compatible smartphones through the updated Olympus Image Share app. The high-performance M.ZUIKO DIGITAL 25mm f1.8 lens has a fixed focal length and is ideal for capturing portraits or close-ups from as little as 9.8 inches away.

## In-Body Image Stabilization

Some cameras rely on in-lens stabilization. The Olympus OM-D E-M10 has an advanced VCM in-body image stabilization system derived from the flagship OM-D E-M1 camera. With the Olympus OM-D E-M10, every photo has stabilization regardless of the lens used. The three-axis VCM stabilization system gives you approximately 3.5 stops of advantage over non-stabilized shooting. The system even can correct for optical rotational blur that in-lens stabilization can't handle. In IS-Auto mode, the OM-D E-M10 automatically applies stabilization in challenging panning shots. Also, the M-IS mode uses the VCM stabilization system in movie mode.

## Fast AF Performance

The OM-D E-M10 has an 81-point FAST AF system and 8 fps maximum shooting speed that rivals the performance of the OM-D E-M1. The FAST AF system has improved Group Target AF, which makes use of the 81-point system to track fast-moving, unpredictable subjects. Working in conjunction with the on-board electronics, the OM-D E-M10 has the shortest shooting lag time in its class—approximately 44 milliseconds! This rivals many DSLRs with mechanical shutters.



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THE OM-D E-M10.



## The revolutionary OM-D family offers something for everyone.

With a powerful image sensor and processor, fast autofocus, and a wide-variety of M.Zuiko lenses, the E-M10 can capture crisp, clear images worthy of the OM-D badge. The E-M10 is built to make the family proud. It's the small camera that gets the big picture, so you don't have to choose between portable and powerful.

[www.getolympus.com/em10](http://www.getolympus.com/em10)

OM-D



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# [ FAVORITE PLACES ]

Text And Photography By Chuanxiao Li



## The Rookery At Smith Oaks Sanctuary TEXAS

### Location

We follow wildlife from Haines in Alaska, Bosque del Apache National Wildlife Refuge in New Mexico and Lake Martin in Louisiana, to the Venice Rookery and Alligator Farm in Florida, but The Rookery at Smith Oaks Sanctuary is best for us. It's close to us, only 95 miles east of downtown Houston, located on the Bolivar Peninsula, High Island, in Galveston County, Texas. It lies



on the eastern side of Galveston Bay, inland from the Gulf of Mexico (GPS coordinates: latitude north 29.57445, longitude west 94.38980). There are different ways to get there, but the I-10 is fast. This salt dome raises the elevation of the area to around 38 feet, giving High Island the highest elevation of any point on the Gulf Coast from Mobile, Alabama, through the Yucatán Peninsula. There are more than 20,000 bird-watchers from over 40-plus countries yearly. The Rookery at Smith Oaks Sanctuary is particularly notable for its many bird nests. You need to buy a \$5 daily or \$25 ticket annually for all four sanctuaries.

### Weather

The rookery weather is influenced greatly by the Gulf of

Mexico. Temperatures during the birdwatching season range from mid-40°F to over 90°F, although there are four covered birdwatching decks, which are very helpful during these temperatures. Mosquito net or insect repellent is a must in the morning.

### Photo Experience

Hurricane Ike impacted the rookery with a significant storm surge and winds of up to 110 mph in 2008. All trees in the rookery were wiped out, though bushes were left, and the birds still nested on the bushes the next year. That's best for photography because it means clear, flattering backgrounds

instead of disorderly trees and branches. The distance from the bank to the rookery/islands is about 75 feet, so for the most reach, the best lens focus length is about 500mm. My 600mm lens is a little longer, so when there's multi-bird action, I need a second camera like my Nikon D7100 with 70-200mm lens. My favorite equipment and gear is my Nikon D3S with a 500mm lens and Gitzo tripod with Wimberley gimbal head.

### Best Times

Depending on the weather, we've been to The Rookery at Smith Oaks since 2004. Every weekend and holiday, we arrive at the rookery before sunrise for the best backlight photos. I take an average of 1,000 shots daily. The Houston Audubon Society operates four bird sanctuaries in the area, so it's a famous destination for birdwatchers worldwide, particularly from March 15 through May 15. Every year, from late January to July (the date when birds start to nest changes from year to year), there are thousands of nesting birds that build their houses there.

**Contact:** Houston Audubon, [www.houstonaudubon.org](http://www.houstonaudubon.org).

## Essential Gear...

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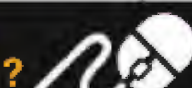
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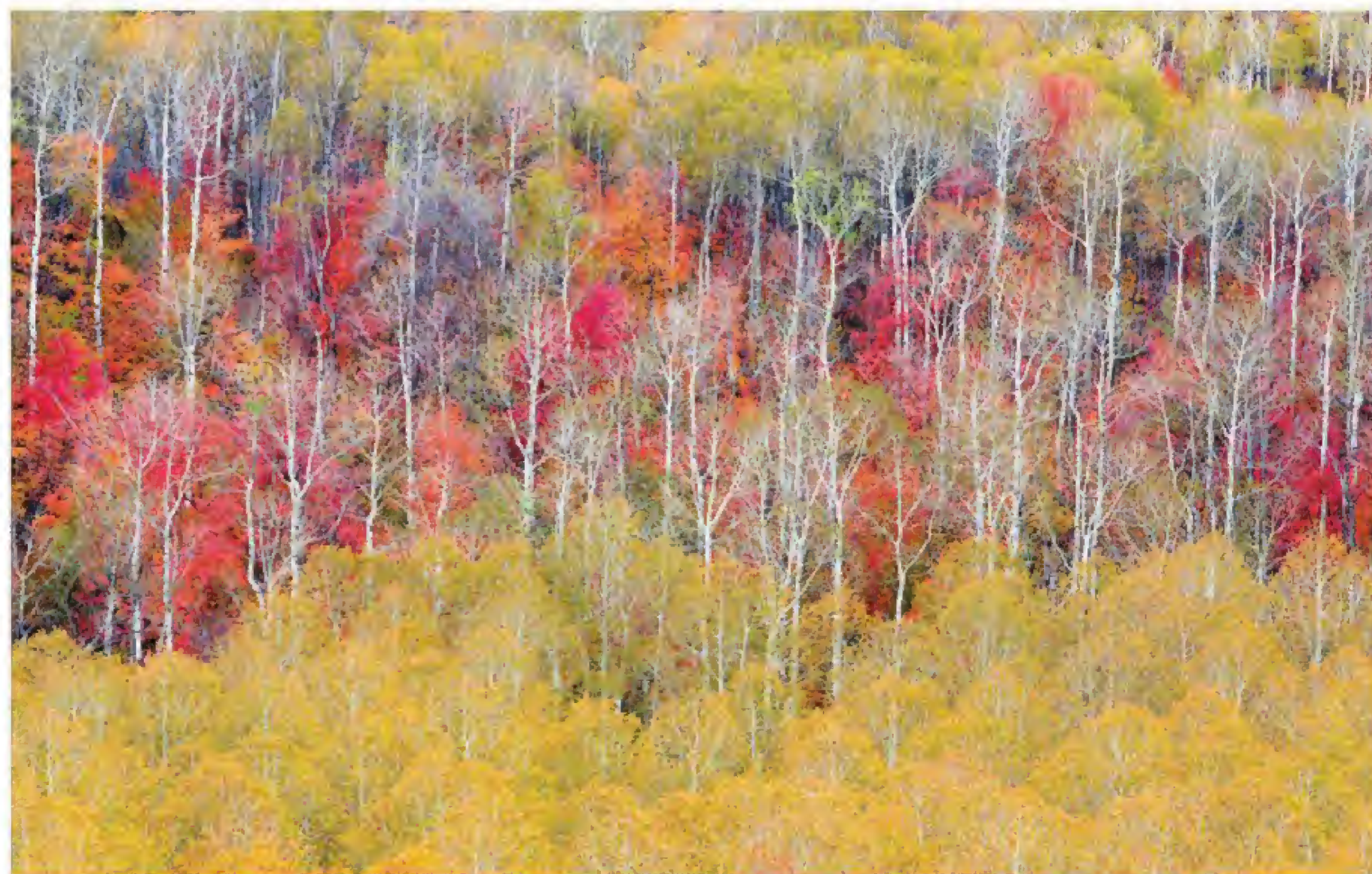




## Telephoto Landscapes

Use your longer lenses for new perspectives on your scenics

[ By Elizabeth Carmel ]



ABOVE: "Autumn's Grace"

Some of my favorite portfolio images have been taken with my telephoto lenses. Zooming in on the landscape compresses features together and can enable more abstract and artistic compositions. When I was out photographing in the autumn of 2013, I used my 300mm lens as often as the wider-angle lenses since telephoto compositions work particularly well for trees and foliage. In this article, I'll share a few of my favorite telephoto landscapes and what to look for when you want to create intriguing telephoto landscape compositions.

For my image "Autumn's Grace," I used a 300mm lens and a 1.7x converter attached, making it a 510mm shot (with my medium-format Hasselblad lens). The telephoto composition compresses the foreground aspens with the foliage in the background, making everything in the image appear on a similar plane. The aspens in the lower portion of the image have lost some of their leaves, making them ap-

pear translucent. Even though this is a telephoto composition, I used basic compositional guidelines, including the Rule of Thirds and an interesting foreground, to create this image.

In "Rainbow Waterfall," I also used the 300mm plus the 1.7x teleconverter. I was in Yosemite Valley photographing a more wide-angle composition in Ahwahnee Meadow, and happened to turn around and see the February sun illuminating Upper Yosemite Falls, creating a colorful rainbow from the spray. The rainbow started higher up the waterfall, and as the sun moved, the colors slowly progressed down the waterfall. I quickly put on my telephoto lens, looked through the viewfinder and noticed the tree in the lower left of the image,

which lent an important sense of scale to the composition. When the rainbow colors met the trees, I knew I had my shot. Sometimes you can't clearly see the composition until you look through the viewfinder with the tele lens on. I like to handhold the camera

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## fleeing vistas

while I'm looking for the composition, then before I take the shot, I lock the camera on the tripod and use a cable release with mirror lock-up so that camera shake is eliminated. There's no tolerance for camera movement when shooting telephoto landscapes, since every bit of camera shake is magnified in the final image.

This image of dogwood blossoms demonstrates how telephoto lenses can be used with wildflower photography. Since telephoto images magnify the subject, the blur in out-of-focus areas is more apparent for a given aperture. You can use this to create the "bokeh" effect with larger apertures, which can be particularly attractive with wildflowers. This lends an artistic softness to the image and helps draw attention to the in-focus blossoms. If all the blossoms were in focus in this image, I think the composition wouldn't work as well, since there would be more distracting elements in the image.

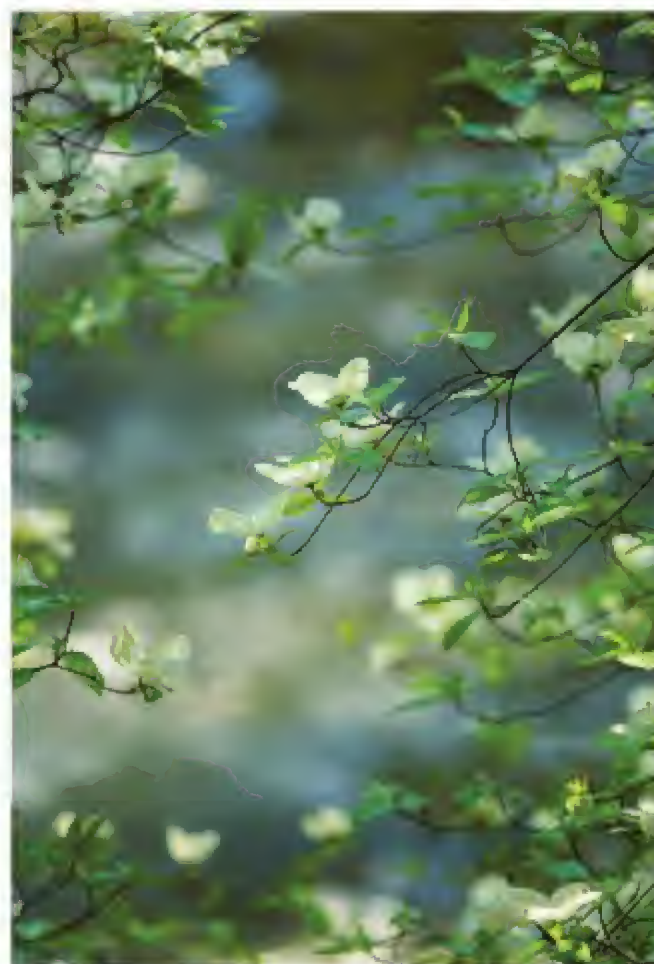
I took "High Country Aspens" with the 300mm lens and 1.7x converter. The telephoto composition allowed me to zoom in on a particular section of this aspen grove in the far distance that had some smaller evergreen trees, which lend a sense of scale and contrast

to the scene. When photographing fall foliage, I think it's important to make the tree trunks visible in the composition. These trunks were very tall and straight, making them an ideal subject. The telephoto composition allowed me to emphasize the beauty and uniformity



of these trunks by compressing the grove. Photographing the aspens from a distance helped me avoid the distortion created by using a wide-angle lens. **OP**

See more of *Elizabeth Carmel's* photography at [elizabethcarmel.com](http://elizabethcarmel.com) and [thecarmelgallery.com](http://thecarmelgallery.com). Workshop information is available by visiting [elizabethcarmel.com](http://elizabethcarmel.com).



**ABOVE LEFT:**  
"Rainbow Waterfall"  
**LEFT:**  
"High Country Aspens"  
**ABOVE RIGHT:**  
"Dogwood Blossoms"

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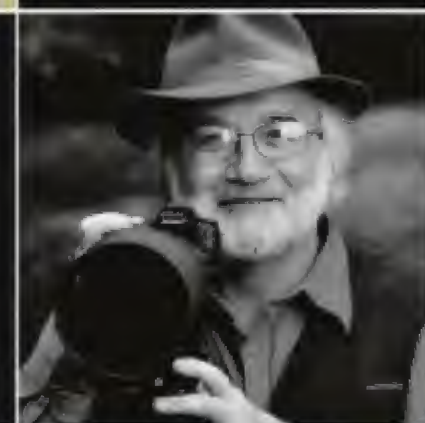
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## Dr. Browning's Birds

A passion for saving lives

[ By Bob Krist ]



*Dr. Andrew Browning got started in photography as a means of documenting a debilitating condition, but that quickly blossomed into a love for capturing the exotic birds of Africa. His passion for avian photography has become a much needed creative release, as he wrestles the demands of surgery and keeping hospital services running in chronically resource-poor areas.*



geons on the entire continent who specializes in the repair and treatment of obstetric fistula, an injury that can occur during labor, and one that affects an estimated two million women in Africa and the developing world, especially in areas where there's little prenatal and intrapartum care. It's a heartbreaking condition that results not only in physical damage to young mothers, but because of the side effects, usually also results in the women becoming social outcasts, and shunned by their families and their communities.

Because of the overwhelming need for more trained fistula surgeons, Browning first picked up a camera to try to spread the word in talks, papers and presentations. "I was doing speaking engagements to raise money for the work

we were doing, and knowing that a picture can speak a thousand words, I started using photography to present the medical conditions, the patients and their living conditions," he says. "But being in Ethiopia, with its amazing wildlife, people and landscapes, I naturally began to take those type of photos, as well."

When most of us think "wildlife photography in Africa," we think "big game." But with a patient-doctor ratio of two million to 12, Browning had little time for safaris. But he found birds everywhere.

"Ethiopia is full of beautiful birds, and they're everywhere—on the hospital grounds, in our garden, wherever we walked in the countryside. There are over 300 species of birds right in the town where I used to live," Browning recalls. He first started observing and photographing the birds right out the window of the operating room between procedures, and soon was hooked. But it wasn't easy.

"You have to be quick and have a keen eye, but if you can observe the habits of the birds, you raise your level of success," Browning says. "For instance, if you know that bee-eaters always come back to the same perch when they're feeding, that makes it easier to get an incoming picture of them in flight."

Between the demands on his time and the money needed to maintain and operate the clinics he runs in Ethiopia and Tanzania, there's little of each left over for trips to game areas to photograph bigger prey. But, occasionally, he does have encounters with bigger animals.

"There was an island in the middle of the river near our hospital, and it had fantastic birdlife," Browning recalls. "I took a reed canoe out to investigate one afternoon when it was slow and was happily shooting away, when I noticed a group of hippos had completely surrounded the island, and they weren't happy that I was there." He got out of there just in time and decided, all things considered, that it might be better to concentrate on photographing the rich birdlife.

These days, Browning contents himself with early-morning birding walks around his house in Tanzania (often in the company of his son). "I first started taking him around with me basically to give my wife a break, but by the time he was two, he could recognize the calls of several birds, and lately, with my new smaller camera, he has taken a few decent shots himself," Browning says.

Although he had been using a DSLR

with an 80-400mm lens for most of his bird work, he has recently switched to a superzoom hybrid camera for its smaller size and greater optical reach. Browning likes to have his camera with him in his backpack everywhere, and with all the shuttling back and forth in bush planes to various clinics and hospitals, every ounce counts.

Plus, it's hard to replace gear, both because of the cost and the isolation. "In Ethiopia, you couldn't buy any gear at all, and it was too risky to ship anything, and since I could only afford to get home to Australia about every three years, I had to be careful not to lose a battery or drop my camera."

Browning finds that early morning and late evening are the best times to photograph because of the light and the relative activity of the birds. Areas with diverse landscapes present the most opportunities, and he loves to get back to several hot spots whenever he can. One of his favorite spots in Ethiopia, where over 415 types of species have been spotted, features grasslands, swampy marshes, lakes and tropical forest, all within a few acres of each other.

"You can just lie in a hammock and wait for the birds to come to you," he says. "Other times, slow stalking is needed, although if you move, often the bird moves, too. Standing still for a while is a good technique and lets the bird get used to your presence, and, of course, all this is much easier without having a two-year-old boy sitting on your shoulders!"

Observing and photographing birds is a tonic for Browning's hectic and overwhelming schedule, but it also serves a different, and some may say, higher purpose. "Photography is very much a release from the intensities of surgery and trying to run hospitals in resource-poor areas," he notes. "But it's also a great tool, telling the story of the work we're doing, trying to raise money for hospitals and clinics and specialized training for surgeons, and for illustrating and discussing surgical techniques long distance on the Internet with other surgeons because there are millions of women waiting for treatment and simply not enough doctors to treat them." **OP**

Learn more about Dr. Andrew Browning and the work of the Barbara May Foundation, which provides health services to women in Africa, at [www.barbaramayfoundation.com/how-can-i-help](http://www.barbaramayfoundation.com/how-can-i-help).

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Browning is one of only about a dozen sur-



Our quick  
guide to some  
of the best U.S.  
national parks  
for shooting



# Photography Icons of The NPS

In this brief guide to the best national parks for photography in the United States, we aim to give you a glimpse into some of this country's greatest treasures. Many of the parks we list here are huge. Yellowstone, for example, our first national park, is more than 3,500 square miles. That's bigger than Delaware and Rhode Island put together! With so much to see, it's impossible to be comprehensive on these pages.

Rather, we hope that what you see and read here will inspire you to make plans to get out and explore these parks on your own.

Under "Best Times," you'll see that we frequently comment about the crowds of summer and the relative quiet of the other seasons. While it can be frustrating to deal with crowds, keep in mind that the vast majority of all national

park visitors never venture more than 100 feet from the side of the road or the parking lot. Head off onto a trail, even a more popular trail, and you can find yourself almost alone within just a few minutes. All of this is to say that you have plenty of opportunities to enjoy solitude and get photos devoid of other people, even during the busiest times of the year.

## Olympic National Park, Washington

★ **Best Times:** Because of the possibility of extreme weather on the Olympic Peninsula, summer is usually considered the best time to visit Olympic National Park. The variety of the landscape here is considerable, from coastline to temperate rain forest.

★ **Most Iconic Locations:** For most people, the coastline and the famous haystacks of Pacific Heights are Olympic's calling card. Sitting just offshore, the haystacks tower out of the water, with trees dotting their peaks. These favorite subjects are often rendered as backlit silhouettes. Up into the mountains, Hurricane Ridge gives you a commanding vantage point over the Olympic Mountains. Quinault Rain Forest is a verdant, moss-covered sanctuary.

## Joshua Tree National Park, California

★ **Best Times:** Spring and fall are the best times to photograph in Joshua Tree. The weather is good, and in spring, if you're lucky, you may see the trees, for which the park was named, bloom. Like the rest of the desert Southwest, Joshua Tree can be very hot in summer, while in winter, keep aware of flash floods that can accompany rain. Despite the pervasive drought in Southern California, flash floods can occur without warning.

★ **Most Iconic Locations:** The park sits between two major desert systems, the Mojave and the Sonoran, which creates a varied landscape. Other than the signature eponymous trees that are prevalent, there are massive granite cliffs and lumpy boulders in the Jumbo Rocks area. In spring and fall, expect the boulders and rock faces to be populated with rock-climbing enthusiasts from all over the world. The Cholla Cactus Garden is an excellent location early and late in the day when you can use sidelight or backlight to capture the distinct glow from the cactus needles. Bring a polarizer to help maintain contrast, and try to shoot during the very edges of the day to bring out the best of Joshua Tree.







### Yosemite National Park, California

★ **Best Times:** The huge crowds that clog the roads in Yosemite in summer thin out in late fall and winter. While many roads in the park are closed in winter, you can still move around quite a bit. We've run more than one *OP* cover of Yosemite in winter, as the juxtaposition of fresh pillows of snow and hard granite peaks can make a truly special photograph. Spring blooms, summer storms and fall color are all magnificent in this most iconic of the U.S. national parks.

★ **Most Iconic Locations:** Perhaps no one explored and photographed Yosemite as completely, and certainly none more famously, than Ansel Adams. To see the most storied locations, flip through Adams' book *Yosemite*, and you'll find all of the best areas of the park. Tunnel View is probably the most famous vantage point of the valley, with its view of El Capitan and Half Dome. Tuolumne Meadows and Ahwahnee Meadow, with its view of Half Dome, are legendary sites for landscape photography. Go to Washburn Point and Glacier Point for views of Half Dome and the surrounding peaks from above.

### Arches National Park, Utah

★ **Best Times:** Arches is open and accessible year-round. In winter, the tourist buses are somewhat less frequent, but the park's manageable size is both a blessing and curse for photographers. The blessing is that it's relatively easy to explore the majority of the park and all of the famous natural arches; the curse is that large tour groups find it just as easy to explore.

★ **Most Iconic Locations:** Delicate Arch is undoubtedly the most famous spot in the park, but it's also the most crowded, with tourists as well as other photographers. Consider hiking to spots like Turret Arch or Double Arch where you stand a better chance of solitude. Stay on the trails, and be particularly careful with tripods to protect the park's biological soil crust.



### Death Valley National Park, California

★ **Best Times:** During spring and fall, the conditions in Death Valley are at their best. Winter can see unpredictable rainstorms and flash flooding, and during summer, the temperatures can rise mercilessly. In 2013, a new June record was set when the park saw 134° F!

★ **Most Iconic Locations:** Many of Death Valley's best photo locations require getting away from the paved roads and parking areas. The Racetrack is the famous playa where you can see the mysterious sailing stones. The drive to the Racetrack is best accomplished with a 4x4 with high clearance, and when you're there, tread very carefully to avoid scarring the delicate mud flats. Sadly, in recent years, a number of the sailing stones have been purloined by unscrupulous visitors. Don't miss Zabriskie Point and Eureka Dunes.



### Yellowstone National Park, Montana & Wyoming

★ **Best Times:** Every season has its own treasures in Yellowstone. The park is open year-round, although at some 3,500 square miles in size, it's impossible to generalize about accessibility in winter, but controversial snowmobiling can get you into unique areas. That said, between the incredible geothermal activity, magnificent landscapes and intense wildlife activity, there's something to photograph all year round. Summer crowds can make traversing the park difficult, so be prepared to move slowly.

★ **Most Iconic Locations:** While geysers, the famous Grand Prismatic Springs and free-roaming bison are top subjects for many visitors, the forces of water have left a distinct mark on the park, which has its own Grand Canyon carved by the Yellowstone River. Upper and Lower Yellowstone Falls are just two of the more than 300 falls in the park. You can photograph bighorn sheep at Dunraven Pass, and Lamar Valley is a good place to spot elk and maybe even a black bear or a grizzly.



### Everglades National Park, Florida

★ **Best Times:** Everglades is best photographed in the dry season (December through April). Wildlife concentrates near "gator holes," temperatures are mild, and mosquitoes are fewer. Wet season (May through November) tends to be hot, humid and rainy, with lots of bugs.

★ **Most Iconic Locations:** The mangrove swamps of the Flamingo and Gulf Coasts certainly say "Everglades," as does the sawgrass prairie at Shark Valley, and, of course, the wading birds—you'll find 16 different species, including white ibis, wood stork and egrets.

### Glacier National Park, Montana

★ **Best Times:** Glacier is best in summer when temperatures are warm and vegetation is at its peak. Summer is also the time when you're likely to get big thunderstorms that create dramatic skies. For photographers, the mountains and lakes are the park's most popular subjects. Winter is magnificent, but conditions make it difficult, if not impossible, to get to prime locations.

★ **Most Iconic Locations:** St. Mary Lake is a classic alpine lake that offers spectacular reflections of Little Chief Mountain. Grinnell Glacier is the most famous glacier in the park. It's a considerable hike to get to it, but well worth it. Hidden Lake is just a short walk from the road, but offers some of the most iconic views in the entire park. Hidden Lake is famous for being almost right on top of the Continental Divide.





### Sequoia & Kings Canyon National Park, California

★ **Best Times:** Yellowstone is famous for being the first national park in the U.S. Many people think that Yosemite was the second, but it was, in fact, Sequoia National Park. With the creation of Kings Canyon National Park immediately adjacent to Sequoia, the two parks have melded into Sequoia & Kings Canyon (SEKI). Located in the High Sierra, there's limited access in the colder months, but spring through fall are prime time throughout SEKI.

★ **Most Iconic Locations:** The giant sequoias are popular with the throngs of tourists who traverse the main thoroughfares. Getting away from the massive trees, however, you can hike into the high country where you'll be greeted with magnificent alpine vistas, granite mountainsides and high mountain lakes. One of the most spectacular locations is Mineral King; at 7,500 feet of elevation, it's reached by a narrow 28-mile road and features some of the best scenery in the Sierra.



### Zion National Park, Utah

★ **Best Times:** Fall provides pleasant climate and dramatic colors. Winter is beautiful with the snowfall, but many areas require special equipment to access. Summer is hot. Spring brings a variety of weather, as well as wildflowers, which peak in May.

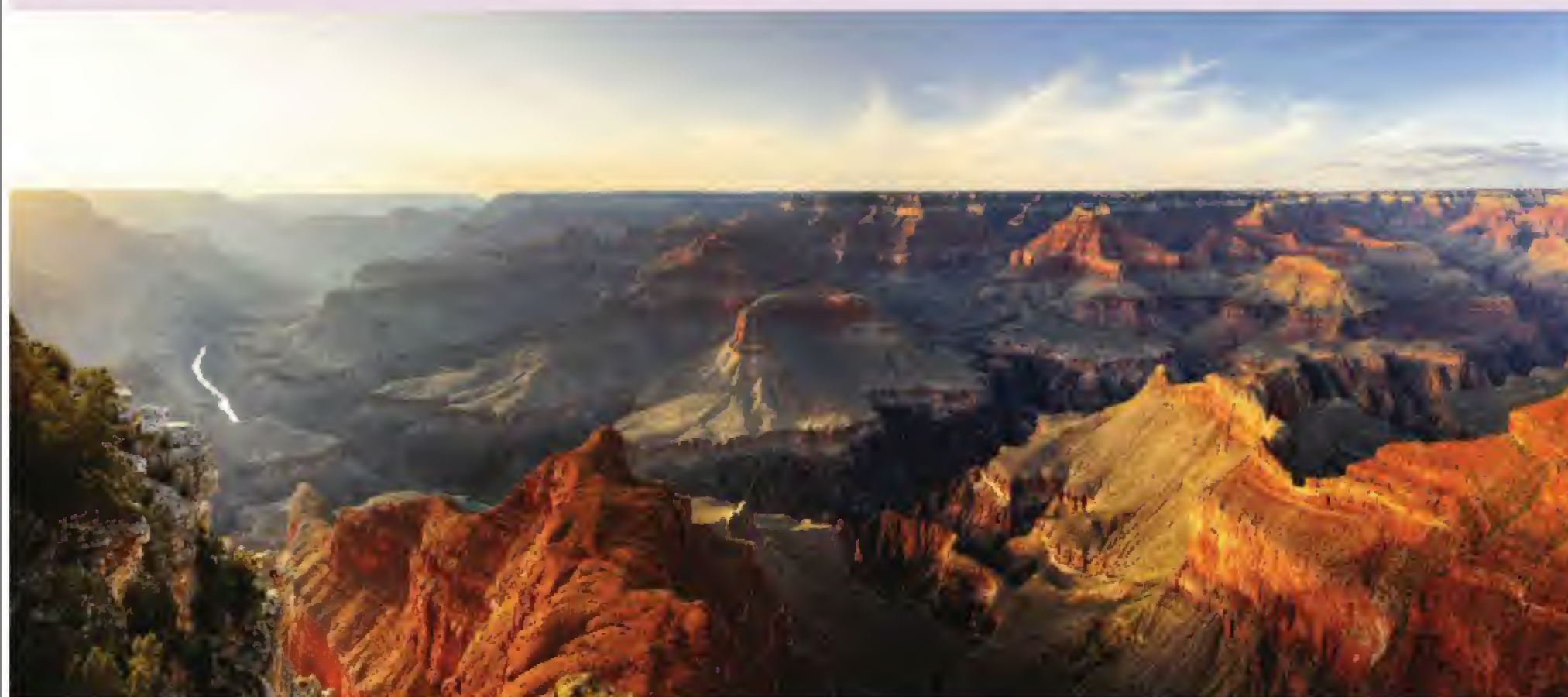
★ **Most Iconic Locations:** Zion is blessed with many arches (including Kolob Arch, one of the world's biggest free-standing arches, and the easier-to-access Crawford Arch), plus spectacular canyons. Some canyons require special skills and gear, but others don't, and there are nice overviews of several canyons from scenic viewpoints. The Virgin River and its Narrows are also especially photogenic.



### Great Smoky Mountains National Park, North Carolina & Tennessee

★ **Best Times:** Great Smoky offers good photo ops year-round, but tends to be more crowded in summer, and parts aren't accessible in winter. If you want fall colors, you'll find them beginning in mid-September in the higher elevations, descending as autumn progresses. You'll also find conditions for pristine winter snow photography, as well as spring wildflowers. Different hiking trails provide a variety of subject matter year-round.

★ **Most Iconic Locations:** The classic overview is from overlooks along U.S. 441 and Clingmans Dome Road. There are many waterfalls, including two you can drive to, Meigs Falls and Place of a Thousand Drops. Open areas like Cataloochee and Cades Cove offer the best chances of wildlife encounters. Many historic log buildings can be found in the park.



### Grand Canyon National Park, Arizona

★ **Best Times:** As one of the most popular parks in the entire National Park system, there's no bad time to visit the Grand Canyon. Winter has always been particularly popular with landscape photographers who want to catch the possibility of fresh snow against the red rock and desert flora. Summer offers the chance to capture booming monsoon thunderstorms, but those dramatic skies can be hazardous due to lightning strikes along the canyon rim. The North Rim is closed in winter, and crowds are smaller in spring and fall.

★ **Most Iconic Locations:** If you've never been to the Grand Canyon, prepare to be stunned. It's truly aptly named, and it's easy to get overwhelmed visually as you struggle to take it all in. We can't possibly do justice to the range of photo possibilities available to a photographer. Toroweap Overlook is a perennial favorite spot, although the compositional possibilities are somewhat limited. Mather Point is probably the most famous vantage point to capture a big view of the canyon. If you're in shape, hiking down to the canyon floor, with a guide, will get you into less photographed territory. The North Rim isn't to be missed if it's open.

#### ► MORE On The Web

Find a huge archive of articles on the best locations for landscape and wildlife photography on the OP website at [outdoorphotographer.com](http://outdoorphotographer.com).

### Acadia National Park, Maine

★ **Best Times:** Fall in New England offers lovely colors, which peak in mid-October, and relatively mild conditions. Summer can get busy, and winter, quite cold. Native asters and goldenrods bloom in late summer.

★ **Most Iconic Locations:** Cadillac Mountain provides an exceptional overview of the area, plus good sunset/sunrise shooting. Somes Sound is "the only fjord on the East Coast." Eagle Lake and miles of Acadia coastline offer great photo ops, from the pastoral to the dramatic.





# The High Concept Image

Pro tips to help you take your photos to a higher level

TEXT AND PHOTOGRAPHY BY IAN PLANT

**H**igh-concept photographs go beyond mere literal representations of your subjects; instead, they seek to use light, composition, mood and color creatively. On one level, high-concept photography is the difference between “snapshots” and “art”—but it’s so much more than that. It’s the difference between merely documenting your subjects and telling a compelling story instead. It’s about going from “meh” to “wow!” It’s about showing your viewers something they haven’t seen before—and showing them your personal and unique artistic vision. Most of all, it’s about moving past the low-hanging

fruit and reaching for the treetops instead.

We all know what “low-concept” photographs are because we’ve all taken them (in fact, I take them all the time). When first learning photography, I think it’s fair to say that we all take pictures of things; we point our cameras at our subjects, without thinking too much about how to transform the subject using creative expression. Low-concept photography can also describe photographs that have a primary purpose of creating a literal or documentary interpretation of the subject. There’s nothing wrong with low-concept photography—many editorial outlets and commercial appli-

cations require a straight approach, and for some subjects, the low-concept approach works best—but if you’re looking to stand out from the crowd, you’ll need to be a bit more creative.

High-concept photography moves past a “straightforward” or “literal” approach. Famous photographer Minor White once said, “One should photograph objects, not only for what they are but for what else they are.” More than just some artistic mumbo jumbo, this quote gets at the heart of high-concept photography. It starts with the process of artistic abstraction—seeing your subjects not as rocks, trees or bears, but

rather in terms of shape, color, light, motion and energy—that is, seeing your subjects “for what else they are.” High-concept photography seeks to capture mood and emotion, and to use light, color, composition, time and moment creatively. A high-concept photograph might reduce the primary subject to just an element of the overall composition, rather than focus on it alone. High-concept photography, in a sense, is all about moving past the obvious and exploring your subject’s hidden truth.

Although this is by no means an exhaustive list, here are a few of my favorite techniques for creating high-concept

photographs. All of these techniques aid in the photographer’s effort to engage in the process of *artistic transformation*—the act of imposing the artist’s own vision on the subject or scene photographed. The final goal of high-concept photography is to present the world in a way not seen before by viewers, to give them something unique and fresh, and to let the photographer’s personal vision emerge. Sometimes I use just one technique, and sometimes I use a combination of techniques to bring my images to the next level; often, one or more technique may bleed into the next. The individual techniques don’t really matter so much, and by no means do your photos need to look like mine to be considered high concept. The important thing is to think creatively at all times and to have the courage to try something out of the ordinary.

## **1** Don’t just record your subject; instead, capture a theme, concept or story.

Everyone—and everything—has a story to tell, and it’s the photographer’s job to figure out what that story is and to present it to others in a compelling way. The story should emerge from your subject, of course, but the high-concept photographer can also add his or her own personal artistic spin. The story doesn’t have to be a complex narrative; it can be a simple concept or theme. As long as you arouse interest or emotion on the part of your viewer, you’re on the right track.

A lot of things can help you tell a story with nature images: interesting weather, the line of sight or the pose of an animal, or even a brief, but unique and meaningful convergence of natural elements. What you should be looking for are what I like to call “story cues”—

*These photos show high-concept and low-concept compositions of Angel Falls in Venezuela. Ian Plant created the high-concept image by using a 10-stop ND filter and making several long exposures during peak sunset light. This captured the movement of the clouds across the sky. Canaima National Park, Venezuela. Canon EOS 5D Mark III, Canon EF 16-35mm f/2.8L II USM, ISO 100, f/8, 141 sec.*





the elements of a photo that get viewers interested in the subject's story. Just as a good composition visually entices the viewer, story cues can encourage the viewer to linger and study an image.

Just remember, when you make a photo, not just one, but at least three stories are often the result: the real story behind the photo, the story that you're trying to tell others as an artist (which may or may not be connected with the true story, depending on your artistic whim), and the story that each viewer extracts from the photo (which is often completely untethered from the first two stories). There's no need to try to make all three stories the same; there's especially no need to try to force your viewers to see the story you're trying to tell. It's sufficient to make a photograph that sets viewers' imaginations on fire.

## 2 Move your feet and seek novel compositions and juxtapositions.

I see it all the time—photographers who show up to a location, drop their camera bag and start shooting, never moving from that first spot. Successful photography is all about moving your feet, and looking for unique and compelling angles. High-concept photography, in particular, requires finding fresh perspectives. Learning to see scene elements as abstract shapes, lines and colors helps; so does a creative eye and a willingness to think outside the box.

Even more important is to be constantly on the lookout for unique and compelling juxtapositions of visual elements. Successful artistic composition is more than just figuring out how to arrange everything within the image frame; it also involves finding meaningful, sometimes even ironic, relationships between elements. A compelling composition will do more than just lead the viewer's eye into the picture frame—it can help tell a story about the subject and arouse the viewer's curiosity and interest.

## 3 Don't just chase "magic hour" light; chase expressive light.

Too often, we end up chasing stunning sunset and sunrise light to the exclusion of other types of light, which can be equally effective (if not more so) for the subject matter at hand. I look for the edges of light, mixed light and complementary colors when creating high-concept images—and not always at sunrise or sunset. Often, high-concept lighting can occur at

other times of day (even in the middle of the day). It's all a question of matching the light to the subject and patiently waiting for unusual lighting events to occur.

I especially enjoy working with a mix of light and shadows. Too often, I hear photographers (especially wildlife photographers) extol the virtues of shooting when conditions are overcast. Sure, even lighting makes exposure and composition easier, and can be perfect for some subjects, but I usually prefer a mix of shadow and light. Such light can be difficult to work with, creating extreme contrast between areas of light and shadow, but the results can be very dramatic, especially when working with spot-lit or backlit subjects. I also often mix natural and artificial light, such as flash. A good external flash is an often overlooked, but nonetheless critical, photo accessory. It can be used to add fill light to subjects, giving them a little extra bit of emphasis and detail, or it can be used in more surreal ways instead. Artificial light gives the nature photographer the power to alter the natural mix of light, imposing more of his or her artistic vision on the subject—something of crucial value to the high-concept photographer. I'm also always looking for opportunities to mix color creatively. Mixing colors that are opposite each other on the color wheel (called "complementary colors")—such as mixing warm and cool tones or color

### MORE On The Web

Go to the OP website at [outdoorphotographer.com](http://outdoorphotographer.com) to see more articles from Ian Plant, as well as Best Of Assignments and Assignment Winners.

**RIGHT:** The run-of-the-mill, low-concept portrait of the egret (near right) contrasts with the high-concept group photo (far right). The apparent visual mismatch between the birds and their reflections was caused by Plant's choice of camera position relative to the scene. It creates a photo that's intricate and unexpected. A dark exposure helps to emphasize the eerie mood he was trying to convey. J.N. Ding Darling National Wildlife Refuge, Florida. Canon EOS 5D Mark III, Canon 500mm f/4L EF IS USM, ISO 800, f/9, 1/500 sec.

**BELOW AND BELOW RIGHT:** In the high-concept photo, twilight blues and an interesting cloud formation come together to create a solemn mood and elevate this scene to a higher level. Vatnajökull National Park, Iceland. Canon EOS 5D Mark III, Canon EF 16-35mm f/2.8L II USM, polarizer, 2-stop graduated ND filter, ISO 400, f/11, 2 minutes.



opposites such as red and blue, or green and magenta—can be very effective.

## 4 Use weather and color to create mood.

Mood is an important component of all great photographs. To me, "mood" encompasses anything that acts to strike an emotional chord with your viewers, forging a connection between them and your photograph. Of course, emotions are mercurial and fickle things, which is why mood is such a difficult subject to discuss—but I'll do my best here to make some sense of it.

For nature photography, use of "atmospherics" is often an effective way of expressing mood. Atmospherics include a number of weather-related phenomenon that occur when moisture in the air reacts to temperature, most notably, mist and fog, dramatic storm clouds and rainbows. Color can also have a powerful impact on the emotional response generated by a photo. Warm tones dominate early and late in the day, whereas cooler tones are more common





**LEFT** The high-concept photo (bottom left) shows “expressive light”—backlight at sunset filtered by dust in the air and a hint of lens flare create a warm golden glow. The effect helps to evoke an emotion and tell a story. Yellowstone National Park, Wyoming. Canon EOS 5D Mark III, Tamron SP 150-600mm F/5-6.3 Di VC USD, ISO 800, f/6.3, 1/400 sec.

at other times, especially at twilight or in deep shadows on a sunny day. Use color creatively to enhance mood.

### 5 Wait for the decisive moment.

I like to think of photography as an exercise in finding “convergences,” those moments when two or more elements come together in an interesting, meaningful or artistically relevant way. Usually, such convergences are fleeting, leading Henri Cartier-Bresson to describe photography as capturing the “decisive moment” in which one is able to record an essential interaction of subjects at its peak. Ideally, the moment should reveal something about the character of the subject or capture an instant when nature’s power is at its fullest, filled with energy and possibility.

High-concept photography and decisive moments go hand in hand. In fact, I would argue that photography, among all art forms, is uniquely suited to capture of the decisive moment, and is what makes photography singular. If you change your thinking from photographing places or subjects to photographing moments, you’ll see a dramatic improvement in your work. The proper moment can elevate even a mundane subject to something special—or it can elevate an already special subject to something

timeless. So, for example, don’t just go to the Grand Canyon to take photos of the Grand Canyon; instead, plan for enough time so you can wait for special moments to occur. The fact that the Grand Canyon is your backdrop will make those moments all the more meaningful!

**6 Go with the flow with long exposures.** A click of the camera shutter captures a moment, plucking a frozen instant from the air and suspending it for all time. Not unlike ice, static photographs can often appear lifeless, cold and dull. The high-concept photographer resists this characteristic of still capture, and instead strives to impart a sense of motion, energy and life to his or her pictures, seeking to capture the dynamic forces at work in nature, creating an illusion of movement and vitality. One way of bringing energy to your photos is to use long exposure times of several seconds or even several minutes. Long exposures can help you capture a new perspective on reality and show the world in an unexpected way.

During long exposures, moving elements gradually lose distinctness and form, becoming abstract and artistic blurs and brushstrokes. You have to be careful to ensure that long-exposure blurring supports your overall composi-

tion or theme. Your DSLR is a perfect tool for experimenting with long exposures, as you get instant feedback after every exposure, allowing you to adjust your exposure time as necessary to get the look you want. Remember, you can’t just simply set your shutter speed to any exposure time you want and expect to get correct results; you need to compensate for the light by changing your aperture or ISO, or using neutral-density filters to alter the amount of light coming into the lens. For longer exposures, a remote shutter release with a shutter lock, used in conjunction with your camera’s Bulb setting, is necessary.

**Conclusion.** You have to force yourself to seek the high-concept image. Sometimes it happens when you have poor conditions, and you’re trying to eke out a decent image from the shoot. Sometimes it happens when you have something truly wonderful, and you decide you need to give it all you’ve got to make sure you fully capitalize on your subject’s potential. Either way, you have to stop and ask yourself: How can I take this to the next level? If you do this for every image you make, you’ll find that your own personal artistic voice shines through—and that your photos will get increasingly noticed by others. or



*Ian Plant is a full-time professional nature photographer, writer and adventurer. His work has appeared in numerous publications worldwide, and he’s a frequent contributor to Outdoor Photographer magazine and OP Daily. He’s also the author of a number of instructional nature photography books, including most recently the critically acclaimed Visual Flow: Mastering the Art of Composition, an artistic tour de force spanning several centuries and different artistic media in its quest to reveal the composition secrets of the great masters. See more of his work at [www.ianplant.com](http://www.ianplant.com).*

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# Eagle Eyes

George Lepp shows how to use extra-long focal lengths to empower natural history photography

Sometimes, opportunity rings. About a year ago, my friend and colleague Brent McGregor called to ask if I wanted to check out a bald eagle nest in a pine tree, below a canyon rim, that a pair had successfully used the year before. Eagle nests are deliberately designed and located for privacy; we humans usually see them from a grounded perspective, looking up into tree branches and catching only “rear-end shots.” I was immediately intrigued by the idea that we actually might be able to see directly into a nest, so we headed out to the observation site that very morning.

And there they were: a splendid pair of adult bald eagles on the nest, near the top of a massive ponderosa pine situated about 200 feet out from the canyon rim where we stood. We had an unobstructed line of sight into the nest. The eagles were clearly aware of our presence, even at that distance, but they appeared undisturbed. I thought about it for a minute. It would have been much easier to photograph if not so far away, but we would have needed to work from blinds, and public access would have been restricted to protect the birds. From this location, along a popular trail, we could easily come and go without causing harm, the light was right, and the main problem to be solved was technical: reaching out to accomplish meaningful photography of the nest’s progression. It was late February and the eggs were not yet laid, so this was a project that would take me through the spring and into early summer. I hovered on the brink of commitment.

## The Value Of Natural History Photography

While I’m now known as a specialist in outdoor, nature, landscape and/or wildlife photography, I started my career some 40 years ago as a natural history photographer. In that era, professional photographers worked with scientists in the field to document and depict the life cycles of subjects of scientific importance due to their biology,

52 Outdoor Photographer [outdoorphotographer.com](http://outdoorphotographer.com)



1 Week



6 Weeks



4.5 Weeks



9 Weeks

*With a perfect vantage point, long lenses, teleconverters, tripods and meticulous attention to technique, George Lepp was able to create an extraordinary series of images of an eagle nest near his home in Oregon. This is a story about the intersection of observation, patience and photography skills.*

BY GEORGE D. LEPP WITH KATHRYN VINCENT LEPP | PHOTOGRAPHY BY GEORGE D. LEPP

## MORE On The Web

You can see more of George Lepp's photography and insightful articles, plus his OP Daily Blog articles, on the OP website at [outdoorphotographer.com](http://outdoorphotographer.com).





**800mm** Canon EOS 5D Mark III with EF 800mm f/5.6L



**1120mm** Canon EOS 5D Mark III with EF 800mm f/5.6L and EF 1.4X tele-extender



**1600mm** Canon EOS 5D Mark III with EF 800mm f/5.6L and EF 2X tele-extender



**2240mm** Canon EOS 5D Mark III with EF 800mm f/5.6L and EF 2X and EF 1.4X tele-extenders



**3200mm** Canon EOS 5D Mark III with EF 800mm f/5.6L and two EF 2X tele-extenders



**4800mm** Canon EOS 5D Mark III with EF 800mm f/5.6L, two EF 2X and one 1.4X tele-extenders

## Extending Your Lens: How Far Can You Go?

I have to admit that I'm always testing the limits of my technique and equipment, sometimes to solve specific problems and sometimes just to see how far I can go! Here are six images that employ long-lens techniques I regularly used during my work with the bald eagle nest. You can extend your photographic reach to nearly ridiculous lengths while achieving reasonable quality if you follow a few rules to minimize movement and establish precise focus.

**1 Quality Equipment.** Start with an excellent telephoto optic and use tele-extenders that are recommended for that lens.

**2 Stable Base.** Employ a sturdy tripod and tripod head. Most professionals prefer a ballhead.

**3 Lock It Up.** Set your camera to Mirror Lock-up or Live View mode to minimize internal camera vibration. If your camera has a Silent LV Shoot option, set it to Mode 1. This will eliminate the last possible source of vibration within the camera mechanism when in Live View.

**4 Hands Off!** Use an electronic cable release or a Wi-Fi smartphone/tablet app to fire the camera without touching it. A delayed shutter timer in the camera can be used if remote releases aren't available.

**5 Look Sharp!** Precise focus is critical because depth of field is very limited at higher focal lengths. On camera, use Live View mode, enlarge the image on the LCD, and use a Hoodman loupe ([www.hoodmanusa.com](http://www.hoodmanusa.com)) to confirm the placement of the focus. Or you can use the CamRanger ([www.camranger.com](http://www.camranger.com)),

which wirelessly transfers all controls to an off-camera smartphone or tablet (I use an iPad 3). It offers a larger focusing image at higher resolution for precise focus and fires without touching the camera.

**6 Compensate For Light Loss.** With each tele-extender added to the lens, you'll lose from one to two *f*-stops of light. At the same time, you'll need faster shutter speeds to stop movement at increased magnification. A camera with excellent high-ISO capabilities allowing use of ISO 800 to 3200 will compensate for the light loss and still deliver excellent image quality.

**7 Be aware of atmospheric degradation of the image due to heat waves, moisture and dust in the air.** Generally, conditions are better in the morning.

behavior, environment or endangered status. In addition to traditional scientific publication, the work was often featured in popular magazines, which published lavish photographic spreads. For example, I worked assignments from *Natural History Magazine* to document the life histories of monarch butterflies, least terns, Belding's ground squirrels and Yosemite toads, to name a few. My stock agency in New York was eager to receive and market the results of any of my life-history projects. For me, the work not only was personally

and professionally rewarding, it also was profitable. But things have changed. The broad availability and diminishing value of images of every conceivable subject makes it much less feasible to undertake a time-consuming life-cycle study. As I watched those magnificent bald eagles sprucing up their nest, I considered the chance they were offering me to immerse myself once again in a wildlife experience and, not least, to apply some cutting-edge technology to the project! One after the other, the eagles perched on a smooth old limb of

the tree, spread their wings and let the winds lift them. They seemed to float on gentle waves as they caught the currents moving along the cliff face, then dropped to skim the icy river at the base of the canyon. I wanted to know them. I wanted to *be* them! I was ready to work them into my schedule for the next four months if they would let me.

### It Takes A Village

Within two weeks, it was apparent the adults were brooding eggs; two youngsters hatched in the second week of

*BELOW: This photo was taken from Lepp's vantage point above the nesting eagles with a 15mm fisheye lens. It was a perfect spot for him to bring his long lenses to bear on the nest over time without disturbing the raptors in any way.*







## Ridiculous Millimeters

Just because you can, doesn't mean you should. But it's always fun to experiment. Just to see how far I could go, I put all my tele-extenders on an 800mm lens and attached them to a Canon EOS 7D camera body. It took two tripods to support the whole rig, and at 14,336mm, it's very difficult to focus on the subject, if you can find the subject at all. So I used a Hoodman loupe on the LCD to find this 9-week eaglet in the nest and a CamRanger for the final capture. The result isn't really usable, but it's interesting.

**LEFT:** 14,336mm! Interesting close-up of a 9-week eaglet, but usable only as an example of exceeding the limits. Canon EOS 7D (1.6X crop factor) with EF 800mm f/5.6L and three EF 2X tele-extenders plus one EF 1.4X tele-extender. **BELOW:** Ridiculous. Here I am with the ultimate setup, at least for now.



Robert Agli

April. I spent the interval doing my research on eagle biology and nesting behavior and laying the groundwork with officials responsible for the area. As the eaglets grew and the project advanced, I built productive new relationships with park rangers and state biologists, and began a lasting friendship with the great ladies who open the local Starbucks before sunrise every morning. A loose network of local photographers got involved in the project, sharing information, celebrating milestones and acting as "docents" at the viewing area to inform visitors. Canon USA gave support by loaning an 800mm f/5.6L lens for the duration of the project.

Spring turned to summer. The chicks grew from tiny, innocent lumps of

fuzz to big, fluffy bundles of attitude. I worked to achieve different perspectives on the story—long-lens approaches, video sequences, feeding, grooming, interactions, hunting forays by the adults, inquisitive predators, sunrise time-lapses—all while enjoying the early-morning beauty and peace of the area. The eagles' neighbors—marmots, squirrels, deer, river otters and many other birds—revealed themselves. The youngsters fledged at the end of June, and by that time, I had made 32 trips (1,700 miles) to the site and spent some 120 hours observing the nest. The eagles endured it all with grace, and the local newspaper celebrated the fledging with a good news article on the front page, using some of my images.

## The Happy Ending

So, here it is, mid-winter again, and I'm looking back at another successful life-history project. I appreciate everyone who helped to bring it all together: Wildlife officials open to responsible photographers, a community that treasures nature, colleagues who share information and expertise, sponsors who support my work and, best of all, a magazine that cares enough to publish it. Thanks, *OP*!

See the video: *George Lepp* captured both stills and video concurrently throughout this project. For a different perspective, see the video on the OPTV section of the [outdoorphotographer.com](http://outdoorphotographer.com) website.

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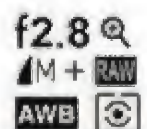
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# ASSIGNMENTS

►► The Best Of The Assignments Submissions From [outdoorphotographer.com](http://outdoorphotographer.com)

1



During the height of winter, as much of North America wrestled with biting cold, heavy snow, and in the case of the Southwest, sunny days in the 80s, I issued several temperature-themed Assignments at [outdoorphotographer.com](http://outdoorphotographer.com). Congratulations to Klaus Priebe, Miguel Costa and Perri Schelat for their winning photographs, which are on display here.

—Christopher Robinson, Editor

## 1) Winter B&W Assignment

PHOTOGRAPHER: Klaus Priebe

EQUIPMENT: Canon EOS 5D Mark II with infrared modification for 820 nanometers, Canon EF 24-70mm f/2.8L II USM, Gitzo 3541 tripod, Manfrotto 054 ballhead, remote shutter release

Capturing the San Juan Mountains in Colorado during winter had been on my bucket list for quite some time and I was just waiting for the right conditions. I always do research on the weather before I go to any particular location to shoot. In December 2012, there was just a fresh coating of about six inches of snow there, and the National Weather Service was calling for partly to mostly cloudy skies with a slight chance of snow that week. As with all of my monochrome images, this one was inspired by the work of Ansel Adams. I've always loved monochrome photography and my eye tends to see everything in that light. I love a colorful landscape, but there's something to be said with the mood, light and substance that are contained in a monochrome image. The winter scene here, with the muted greens of the trees and colorless cloudy sky, really set off the instinct in me to capture it in monochrome infrared. It brings out many details and beauty the eye is unable to see. My processing was pretty basic in Adobe Camera Raw, with some levels and curves adjustments and some slight dodging in the shadow areas. After the ACR treatment, I processed the file with Nik Silver Efex Pro 2 and used the red filtration for the infrared file. I did a little contrast adjustment, amplified the blacks slightly and added about 7% on the structure slider. Then I opened the file in Photoshop CS5 and did the fine-tuning.

## 2) Warmth Assignment

PHOTOGRAPHER: Miguel Costa

EQUIPMENT: Canon EOS 5D Mark II, Canon EF 24-105mm f/4L USM

This picture was taken in Angola, Africa, about 50 miles south of the capital city, Luanda, in July 2013. This beach is called Cabo Ledo, also known as Surfer's Beach. It's one of the few places near Luanda where you can find good surf. I was invited by a friend to go camping on the beach in this beautiful place. We hit the water to surf as soon as we got to the beach, but wave after wave, I started to realize the change in the colors of the sky and that the sunset could be a great one. As I saw the sun going down, I knew it would be a great composition to find a surfer walking to the point and catch her against the sun and the warm sky colors. So I came in and swapped out my surfboard for my camera. The only postprocessing I did was basic RAW processing with Adobe Camera Raw to bring up the colors just a little and to recover some highlight and shadow details that would have been lost in an 8-bit JPEG file out of the camera.

2







### 3) Bitter Cold Assignment

PHOTOGRAPHER: Perri Schelat

EQUIPMENT: Nikon D3, AF-S Nikkor 17-35mm f/2.8, Singh-Ray neutral polarizer, Nikon MC30 cable release, Gitzo GT 3542LS tripod, Kirk BH-1 ballhead

In the winter, Yellowstone is an ethereal and otherworldly wonderland, with unlimited photography opportunities. I was after specific winter scenes, and at the top of my list were ghost trees. I knew I would need frigid temperatures, so I chose a cold winter month with less snowfall, clearer skies and colder temperatures. I wanted steam or fog, as well, so I would need to head toward the geysers and thermal pools. On a clear morning with -10° temperatures in February 2013, I headed straight to the geyser basins and thermal areas. I found these evergreens at Norris Geyser Basin near a thermal pool. Steam from the pool drifted into the trees and covered them in frosty ice. There was no special postprocessing beyond lifting shadows, dodging, burning and basic RAW file conversion.

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When I finally saw the camouflaged Eastern screech-owl in the dead tree, I used my 500mm *f*/4 supertelephoto lens and 1.4x teleconverter to fill the viewfinder with the little raptor and captured a portrait image. Earlier in my photographic career, I would have put away my gear at that point and headed on to new opportunities. Instead, I “holstered the big gun” and used a medium telephoto lens to capture the screech-owl in its environment. I always want working distance for wildlife, so I used my 70-300mm medium telephoto lens at 100mm. The resulting image, more interesting than the portrait image, gave the bird a sense of place and emphasized its cryptic camouflage plumage against the weathered mesquite tree.

New fixed and zoom medium telephoto lenses offer expanded ranges, excellent optics and affordable prices. Nature photographers should consider adding these great tools to their camera bags. Consider the screech-owl. I used a supertelephoto lens for the portrait image, but several excellent zoom telephoto lenses achieve that magnification level, or close to it, with superb sharpness. They also offer you the opportunity to back off from the maximum magnification, without switching lenses, and capture habitat images that can be informative, exciting and interesting to the viewer. Consider this as “reverse extraction,” adding relevant elements to a scene to increase viewer interest or tell a story. The Sigma 50-500mm or 120-500mm lenses, and the new Nikon 80-400mm *f*/4 lens, are extremely sharp and light enough to handhold. (Note: Canon is reported to be working on an upgraded version of its 100-400mm *f*/4 lens.) These lenses have vibration reduction and their extended zoom ranges

# The Versatility Of A Telephoto

Whether photographing wildlife or landscapes, long lenses are great tools for more than just zooming

TEXT AND PHOTOGRAPHY BY DAVE WELLING

offer great compositional capability, providing the wildlife photographer flexibility in capturing wildlife images.

These telephoto lenses aren't just for wildlife; they're also great tools for landscape photography. Wildlife photographers usually start with the longest lens they own, but

most landscape photographers start with a wide-angle lens. Wide-angle, grand landscape images have spectacular impact, but consider using telephoto lenses to capture landscapes differently, especially if there are key elements in the distant part of the scene. Use telephoto

lenses to extract subject matter or key elements from the scene and compose the image around those elements.

Zoom telephoto lenses are also excellent for slight cropping to eliminate extraneous elements from your scene. Cropping a wide-angle landscape im-

age to isolate a distant element doesn't work well. Wide-angle lenses expand the scene, making elements appear farther apart and distant; key elements become small in the scene. Instead, use a telephoto lens to extract elements. Distant mountains become larger rela-





**OPENING SPREAD:** Useful for landscape compositions, as well, telephoto zooms give a variety of framing options and detail shots without the need for extra hiking, like these different perspectives of hoodoos taken in Bryce Canyon National Park, Utah.

**LEFT:** An Eastern screech-owl "hides out" in a mesquite tree on a private Rio Grande Valley ranch in Texas. Taken with the Nikkor 200-400mm f/4G VR lens, the flexibility of the telephoto zoom gave Welling a way to incorporate the bird's environment (far left) while the zooming capabilities highlight the incredible camouflage abilities of the owl (near left).



*"The bison portrait was taken with my 500mm lens," says Welling, "but I switched to a Sigma 70-210mm f/2.8 to include the geysers, putting the bison in his winter Yellowstone home. This approach is 'reverse extraction,' adding relevant elements to a scene to increase viewer interest or help tell a story."*

tive to the overall scene because of the magnification/compression effect of the telephoto lens. Now, you don't have to crop the image. The Snake River Overlook in Grand Teton National Park is perfect for wide-angle and medium telephoto image capture. A 20mm wide-angle lens captures a grand landscape feel, but the Tetons in the background will be relatively small in the image. A 200mm telephoto lens compresses the elements in the image and the Tetons become much more signifi-

cant. You now have two very different images taken from the same spot. This telephoto extraction/compression technique won't work for all landscape images, but is worth considering when you have a key element you want to feature.

Zoom telephoto lenses also provide great compositional flexibility. You can photograph scenics like distant hoodoos in beautiful, late-afternoon light with a zoom telephoto lens using the low end of the zoom range. But light from the setting sun can change rapidly, so if the

background hoodoos went dark while a shaft of light highlights one of the hoodoo formations, you can quickly recompose by zooming out to 200-300mm to extract the highlighted hoodoo and capture a completely different image.

Research your landscape location before you go. Wide-range telephoto lenses may be your only choice when your landscape subjects are significantly distant from your access points. Much of Bryce Canyon can be photographed with wide-angle lenses, but you need a



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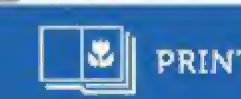
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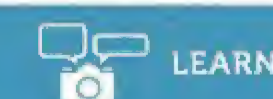
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medium telephoto lens to photograph icons like the Paunsaugunt Plateau, which is miles east of any Bryce overlook. A vertical image of the plateau at approximately 70mm can include amazing summer storm clouds for impact. If the storm breaks up quickly and rainbows form over the plateau, or stunning spotlighting occurs, you can quickly rotate the camera to horizontal, zoom out to 300mm and isolate the plateau with the rainbow or beautiful lighting.

Another great application for telephoto lenses is isolating an element in a scene and making it the sole feature of an image. Standing in the Merced River in Yosemite photographing these great rime ice mounds with El Capitan and Half Dome in the background, I used a 17-35mm wide-angle lens focused very close to the mounds to make them the key element of the image. When finished, I stood up and looked all around for other subjects, smaller and less grand, but equally interesting. (I recommend you do this no matter what you're photographing.) A dead, but beautiful, black oak leaf hanging on a nearby tree caught my eye. A small ray of light hit the leaf, highlighting the rime ice crystals along its edges. Rime ice was still my key element, but with a totally different perspective. I used my 70-300mm lens at 250mm to isolate the leaf and frame the image with as little background as possible. I was several feet from the leaf so I could use a shallow depth of field,  $f/5.6$ , to blur the background, but keep the subject in apparent sharp focus. Telephoto lenses have much shallower depth of field for a given  $f$ -stop than a wide-angle. You can use this to help blur backgrounds and intrusive elements. But, remember, unless you're isolating/featuring a specific element like the leaf, as you increase magnification, you may have to increase your aperture to give you enough apparent depth of field to make the whole scene appear in focus. Use your depth-of-field preview or camera monitor at 100% to check sharpness.

Telephoto lenses can help you create sequences that tell a story. Consider Angel Falls in Canaima National Park in Venezuela. After hiking a mile to the overlook for the falls, you're still a mile away, so even though almost 3,000 feet high, you still need 60-70mm to capture the full height of the falls and not have them look miniscule in your photo. A lightweight, cover-all-bases lens like the 28-300mm zoom from Nikon or an



*When used with shallow apertures, a telephoto can compress the subject against out-of-focus backgrounds. Welling isn't afraid to use telephotos for subjects that normally would be considered to be macro, either. LEFT, TOP TO BOTTOM: A black oak tree bud covered in hoarfrost; a dead golden-hued black oak leaf; rime ice on a fir tree bough with a seed pod hanging from a tree. All captured near the Merced River in Yosemite National Park, California*

equivalent range from other manufacturers is perfect for hiking in the tough, humid, rain-forest conditions. You can use one lens like this to tell a story of your Angel Falls expedition.

From the drop-off point for the mile hike in, with the falls peaking above the rain forest, a 200mm lens setting allows you to capture the DC-3 that dropped you off as it flies above the falls. Use the wide-angle end of the range to capture rain-forest landscapes on the way to the falls. Use the 60-70mm range to capture the full height of the falls. Use the 150-300mm range of the lens to isolate sections of the falls. A telephoto lens can also help with perspective. A photographer in our group made the one-mile trek from the overlook to the base of the falls. From the overlook, I zoomed in to capture the base of the falls and incorporated him into the lower-left area of the compressed composition to highlight the perspective of the true size and scale of this magnificent waterfall. A wide-angle would have exaggerated the same foreground subject into unrealistic proportions. OP



See more of Dave Welling's photography on his website at [www.strikingnatureimagesbydavewelling.com](http://www.strikingnatureimagesbydavewelling.com).

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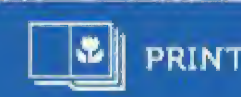
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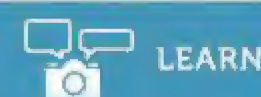
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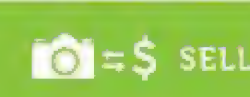
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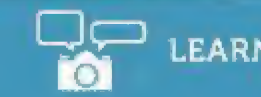
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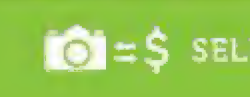
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A long lens can “bring the subject to you,” producing a larger image in the image frame and making long lenses particularly popular with wildlife and bird photographers. But they can also be useful to landscape shooters, as they allow you to zero in on more distant portions of a scene, and in so doing, flatten the perspective. (Note: It’s the great distance, not the focal length, that compresses the perspective. If you shoot from the same spot with a shorter lens, then crop the resulting image to match the area shown in the longer-lens image, the perspective will be the same.)

Telephoto zooms offer additional benefits. First, as with any zoom, you get a whole range of focal lengths in a single package. That makes reframing much simpler (just rotate or push/pull the zoom ring, rather than physically change lenses) and minimizes dust on the image sensor by minimizing the number of lens changes in outdoor conditions. Telephoto zooms can take you out to 500mm for not much over \$1,000, while a good 500mm prime lens can cost five to 10 times that. But a telephoto zoom offers another advantage over a single-focal-length lens. You can zoom back to the widest focal length to “find” your subject, which is convenient for wildlife and especially useful for birds in flight, then zoom in to frame, as desired. It can be hard to acquire a small or fast-moving subject with a long prime lens and its very narrow angle of view.

For our purposes here, “telephoto zoom” means one with its entire focal-length range in the longer-than-“normal” category: beginning at 70mm for full-frame cameras, at 50mm for APS-C cameras and at 35mm for Four Thirds DSLRs (Four Thirds System DSLRs are no longer in production, but some readers no doubt have one, and Four Thirds lenses can be used, via adapter, with Micro Four Thirds cameras).

# Super Telephoto Zooms

We decipher the technobabble behind these nature photography mainstays



## What Does Telephoto Mean?

In general, lenses close in focal length to an image format’s diagonal measurement are considered “normal” for that format. For example, a 35mm film frame (or a “full-frame” DSLR sensor) measures 36x24mm and has a diagonal measurement of 43.2mm. Lenses in the 40-55mm range are considered “normal” for this format.

Lenses shorter than the format’s “normal” lens take in a wider angle of view and are called “wide-angles.” Lenses longer than a format’s normal lens take in a narrower angle of view, but instead of calling them “narrow-angle” lenses, most photographers (including us here at *OP*) tend to call them “telephotos.” Actually, “telephoto” refers to a specific optical design in which the focal length is longer than the lens’ physical length. But most of today’s long lenses are indeed telephotos, which is kind of nice: It makes them less bulky. “Long-focus” is another term for these lenses.

Bottom line: A telephoto lens has a focal length longer than the “normal” focal length for a given format, producing a narrower angle of view and greater magnification.

## Maximum Aperture

The aperture is the opening in the lens that lets light in. The larger the aperture, the more light the lens can transmit to the image sensor, so you get a brighter viewfinder image for composing and focusing, and you can shoot at a faster shutter speed in a given light level. But the larger the maximum aperture, the bulkier the lens. Apertures are expressed as *f*-numbers. An *f*-number is simply the focal length of the lens divided by the diameter of the aperture (actually, the diameter of the effective aperture, which is what you see when you look into the front of the lens, rather than the diameter of the physical aperture itself). For example, *f*/4 means the diameter of the effective aperture is ¼ the focal length of the lens, or 25mm for a 100mm lens.

You can see from this why there aren’t a lot of fast long lenses, and why the ones there are cost a bunch. A 500mm *f*/2.8 lens (the fastest 500mm you can buy today) has an effective aperture diameter of  $500/2.8 = 178.6\text{mm}$  (seven inches!) wide open. That means a big, heavy and costly front element (that Sigma 200-500mm *f*/2.8 zoom has a street price of over \$25,000 and weighs more than 30 pounds!). And, yes, the fastest 500mm lens available today is the long end of a zoom—not a prime lens—quite an engineering feat.

## Sharpness

Zoom lenses generally aren’t as sharp as prime lenses of equal focal length and price. That’s because a prime lens must be corrected for only the one focal length, while a zoom must be corrected for a whole range of focal lengths. And corrections that help at one focal length can make things worse at another. Various aberrations and distortions tend to be more visible in zoom lenses.

That said, however, today’s better zoom lenses are excellent, and for many—including working pros—the benefits outweigh the drawbacks.



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## Variable Vs. Constant Aperture

Some zoom lenses (generally, the higher-priced ones) maintain a constant aperture throughout their zoom range. For example, a 70-200mm *f*/2.8 zoom has a maximum aperture of *f*/2.8 at 70mm and at 200mm, and everywhere in between. The aperture doesn’t change as you zoom the lens. With variable-aperture zooms, the maximum aperture does change as you zoom, becoming “slower” at the longer focal lengths. For example, a 70-300mm *f*/4-5.6 zoom has a maximum aperture of *f*/4 at 70mm and a maximum aperture of *f*/5.6 at 300mm. Just how quickly the aperture “slows” as you zoom varies from lens design to lens design; with most, you can assume halfway through the zoom range that the maximum aperture is close to the slower end of the range.

If you use the camera’s built-in TTL exposure meter, it doesn’t really matter which type of zoom you use. The TTL meter automatically will compensate for the change in aperture as you zoom. If you determine exposure manually with a handheld meter (or using the Sunny 16 Rule), you’ll have to compensate manually for the slower apertures at the longer focal lengths.

The variable-aperture designs are also more likely to shift focus as you change the focal length. If you’re using AF, this doesn’t matter, as the system will compensate automatically. But if you focus manually with a variable-aperture zoom, you’ll have to focus at the focal length you’ll be using for the shot. It’s nice to zoom to the longest focal length to get a magnified image for focusing, then zoom back to the desired composition, but with lenses that shift focus as they zoom (which includes some constant-aperture zooms), you can’t do this because the focus will shift when you change the focal lengths. Test your zoom(s) to see if focus shifts when you zoom. If in doubt, it’s always safer to focus at the focal length you’ll be using for the shot.



## Angle Of View

Shorter focal lengths provide wider angles of view than longer ones. But just how wide or narrow a given lens' angle of view also depends on the format of the image sensor. Smaller sensors "see" less of the image produced by a given lens, producing a narrower angle of view. Larger sensors see more of the image, producing a wider angle of view. See the diagram at right.

Smaller DSLR sensors generally are assigned "crop factors" based on how their angles of view compare to that of a full-frame sensor (36x24mm, the size of a 35mm film image frame). In the early days of digital, this helped film shooters quickly understand what a given lens would do when used on a smaller-sensor camera (early digital SLRs had smaller APS-C sensors, so named because they were approximately the size of an Advanced Photo System "Classic"-format image frame). As mentioned earlier, a full-frame DSLR image sensor measures 36x24mm and has a diagonal of 43.2mm. An APS-C sensor measures around 23.6x15.6mm and has a diagonal of around 28.3mm. Since the full-frame diagonal is about 1.5X longer than the APS-C diagonal, a given lens on an APS-C camera produces the same field of view as a lens 1.5X longer on a full-frame camera. For example, a 200mm lens on an APS-C camera frames like a 300mm lens on a full-frame camera—great for telephoto fans. But a 28mm lens on an APS-C camera frames like a 42mm lens on a full-frame camera—not so good for wide-angle fans.

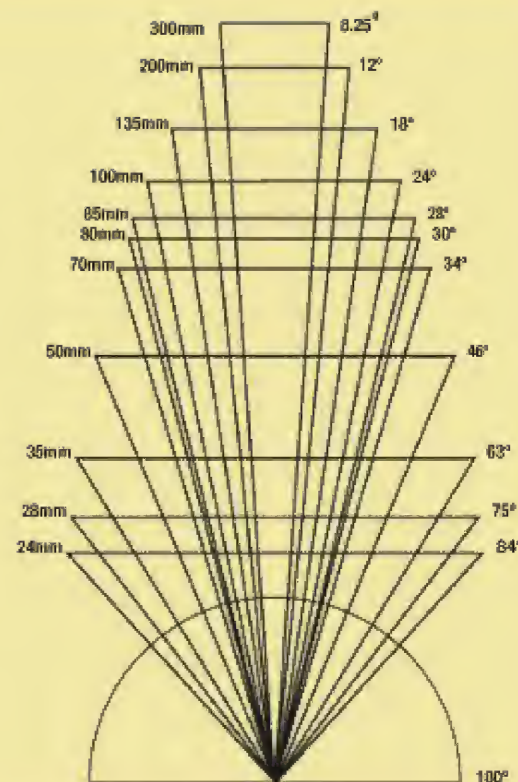
That's why the kit zooms sold with APS-C cameras start at 18mm: An 18-55mm zoom on an APS-C camera frames like a 27-83mm on a full-frame camera.

Four Thirds System sensors measure 17.3x13.0mm, with a diagonal measurement of 21.6mm—half that of a full-frame sensor. So a given focal length on a Four Thirds System camera frames like a lens twice as long on a full-frame camera: A 200mm lens on a Four Thirds DSLR (or Micro Four Thirds mirrorless camera) frames like a 400mm lens on a full-frame DSLR.

Note that this is a crop factor, not truly a magnification. When focused at a given distance, a given focal length produces an image of a given subject as a given size at the focal plane. For example, a 100mm macro lens focused on a 20mm-high object at 1:2 produces an image of the object 10mm high at the image plane (sensor or film). This size doesn't change just because you put a larger or smaller sensor at the image plane. A smaller sensor just crops more tightly, so the object's 10mm image takes up more of the frame. For most practical purposes, it can be considered magnification, but in reality, it's not.

Several manufacturers offer lenses designed for full-frame cameras (these include 35mm SLR lenses) and lenses designed specifically for the smaller APS-C sensor. The full-frame lenses cover an image circle 43.2mm in diameter—the diagonal measurement of the full-frame sensor (or 35mm film frame). APS-C lenses cover an image circle of around 28.3mm—the diagonal measurement of an APS-C image sensor. If you use an APS-C lens on a full-frame camera, the image will vignette. Canon calls its APS-C lenses EF-S, and you can't even physically mount one on a full-frame camera. Nikon calls its APS-C lenses DX, and if you mount one on a full-frame Nikon DSLR, it will crop to the smaller DX format automatically. Sigma calls its APS-C lenses DC, Sony—DT, Tamron—Di II and Tokina—DX. (Pentax doesn't make full-frame DSLRs, so their DSLR lenses are APS-C.)

The advantages of APS-C lenses are that they can be designed to be smaller and perform better with smaller sensors. But if you intend to go full-frame some day, you'll be better off buying full-frame lenses now, even if you currently use an APS-C camera—you won't be able to use APS-C lenses on your new full-frame camera and take full advantage of its sensor's megapixels due to the crop factor.



## Focal-Length "Breathing"

With many zoom lenses (especially those using internal focusing), the maximum focal length decreases as you focus closer—in some cases, a 70-200mm zoom winds up with a maximum focal length of maybe 140mm when set at 200mm and its closest focusing distance. For most purposes, this isn't a big deal. If you're at the lens' minimum focusing distance, a really long focal length isn't as important as with distant objects. If you do insect and flower photography, consider the minimum focusing distance and magnification: If your 70-200mm lens focuses down to 0.25X, it doesn't really matter if it's doing that at 200mm or 140mm; you're still getting 0.25X. (Of course, this focus breathing means you have less working distance—less space between you and the insect—but at these distances, that's not as critical as at true macro shooting distances.)

Internal focusing offers its advantages. First, the lens doesn't change physical length during focusing, good for balance. Second, the front element doesn't rotate during focusing, so polarizers and graduated and other orientation-sensitive filters maintain their orientation. Note that while internal-focusing lenses don't rotate or extend as they focus, many do rotate and extend physically as they're zoomed.

## Zoom Method

Most zooms today use a zoom ring, which you rotate to change focal lengths. But with some, you push or pull the zoom control rather than rotate it. The push-pull type is probably more prone to sucking dust into the lens, but we haven't found that to be a big problem. So, mostly, it's a matter of personal preference. Some photographers feel more comfortable with the rotating ring, others, with the push-pull control.



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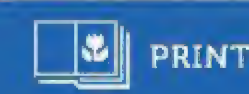
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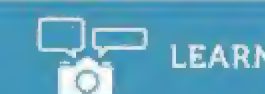
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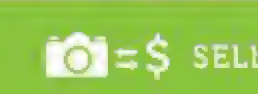
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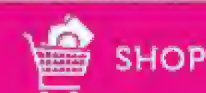


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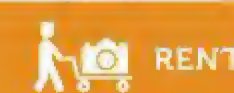
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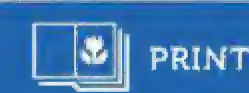
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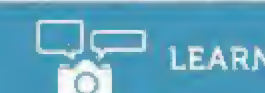
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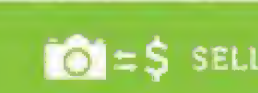
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## Exotic Elements

Most telephoto zoom lenses incorporate low-dispersion elements to minimize the effects of chromatic aberrations, improving image quality. They have designations such as LD, SLD, ED, ELD, HID, ULD and the like, depending on manufacturer and degree of correction. Fluorite elements are even more effective at compensating for chromatic aberrations, but also very costly, and are found only in some high-priced lenses. Lenses with low-dispersion elements are "better" than those without, but you should always test a telezoom before buying (you can rent many for a couple of days), rather than just depend on the presence and number of such elements.

Aspherical elements correct spherical aberration, which is more of a problem with wide-angle lenses, so they aren't often found in telezooms.

### ► MORE On The Web

Go to [outdoorphotographer.com](http://outdoorphotographer.com) for more in-depth articles on lenses and lens technology, as well as comparison charts on available models.

## AF Motor

Most newer telezooms incorporate AF motors. The best ones are quick, smooth and quiet: Canon's USM, Nikon's AF-S, Olympus' SWD, Pentax's SDM, Sigma's HSM, Sony's SSM II and Tamron's USD. The main thing to check regarding a telezoom's AF motor is whether you can change focus while in AF mode. If you're photographing a bird in flight, for example, and the AF system loses focus and focuses down to its minimum focusing distance, it's a lot quicker if you can just turn the focusing ring back to infinity and press the button to start AF again, rather than have to switch to manual focusing mode, reset focus, then re-enter AF mode. It's also helpful to be able to "ballpark"—focus on the flying bird manually before activating the AF system—something you can't do if the lens won't let you focus manually in AF mode. (With some lenses, rotating the focusing ring manually while in AF mode can damage the AF motor; you don't want this type of lens if you're photographing birds in flight.)

## Built-In Stabilization

Many Canon, Nikon, Sigma and Tamron telephoto zooms come with built-in optical image stabilization (Canon's designation for this is IS, Nikon's is VR, Sigma's is OS and Tamron's is VC). This feature moves a group of lens elements as you shoot to minimize the effects of handheld camera shake. Olympus, Pentax and Sony DSLRs have built-in sensor-shift stabilization, which moves the image sensor rather than lens elements to compensate for camera shake. This has the advantage of being available with any lens you put on the camera, not just special stabilized ones. The drawback is that you don't see the stabilizing effect in the eye-level optical viewfinder. If you work handheld with a long lens, stabilization is a wonderful boon; if you work from a tripod, check the instructions for the lens or camera to see whether you should switch the stabilization off.

### Sigma 150-500mm F/5-6.3 APO DG OS HSM

This has been the go-to lens for wildlife photographers on a budget, the only telezoom with built-in stabilizer to go out to 500mm until the just-introduced Tamron 150-600mm. We know several bird photographers who use the Sigma 150-500mm lens with very good results, and we liked our test example when we tried it. A good stabilized zoom that goes out to 500mm for a bit over \$1,000—very nice. If you're a wildlife photographer on a budget, we suggest that you check them both out.

If you use a Pentax or Sigma DSLR and need a long lens, this is your best option. Pentax's only lens longer than 300mm is a 560mm prime that costs thousands more, and the Tamron 150-600mm isn't available in Pentax or Sigma mounts.

## Coatings

Each glass/air interface in a lens causes a loss of light due to reflections, and telezooms generally have lots of elements. So, manufacturers coat the surfaces of the elements to reduce reflections, minimizing this light loss. A telezoom with good coatings on all element surfaces can transmit a much greater percentage of the light than a lens with uncoated elements. The coatings also help to produce good color rendition. The newest coatings (found, naturally, on the newer lens designs) are even more effective than older coatings.



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# TELEPHOTO ZOOMS

Lens	Elements/ Groups	MFD	Max. Magnif.	Filter Size	Size (inches)	Weight	Est. Street Price	Mounts
<b>For Full-Frame (can also be used on APS-C):</b>								
Canon EF 70-200mm f/2.8L USM	18/15	4.9 ft.	0.16X	77mm	3.3x7.6	2.9 lbs.	\$1,449	Ca
Canon EF 70-200mm f/2.8L IS II USM	23/19	3.9 ft.	0.21X	77mm	3.5x7.8	3.3 lbs.	\$2,499	Ca
Canon EF 70-200mm f/4L USM	16/13	3.9 ft.	0.21X	67mm	3.0x6.8	1.6 lbs.	\$709	Ca
Canon EF 70-200mm f/4L IS USM	20/15	3.9 ft.	0.21X	67mm	3.0x6.8	1.7 lbs.	\$1,349	Ca
Canon EF 70-300mm f/4-5.6 IS USM	15/10	4.9 ft.	0.26X	58mm	3.0x5.6	1.4 lbs.	\$649	Ca
Canon EF 70-300mm f/4.5-5.6 DO IS USM	18/12	4.6 ft.	0.19X	58mm	3.2x3.9	1.6 lbs.	\$1,399	Ca
Canon EF 70-300mm f/4.5-5.6L IS USM	19/14	3.9 ft.	0.21X	67mm	3.5x5.6	2.3 lbs.	\$1,599	Ca
Canon EF 75-300mm f/4-5.6 III	13/9	4.9 ft.	0.25X	58mm	2.8x4.8	1.1 lbs.	\$199	Ca
Canon EF 75-300mm f/4-5.6 III USM	13/9	4.9 ft.	0.25X	58mm	2.8x4.8	1.1 lbs.	\$234	Ca
Canon EF 100-400mm f/4.5-5.6L IS USM	17/14	5.9 ft.	0.20X	77mm	3.6x7.4	3.1 lbs.	\$1,699	Ca
#Canon EF 200-400mm f/4L IS USM Ext. 1.4x	25/20	6.6 ft.	0.15X	52mm†	5.0x14.4	8.0 lbs.	\$11,799	Ca
Nikon AF-S 70-200mm f/2.8G ED VR II	21/16	4.6 ft.	0.25X	77mm	3.4x8.1	3.4 lbs.	\$2,399	Ni
Nikon AF-S 70-200mm f/4G ED VR	20/14	3.3 ft.	0.27X	67mm	3.1x7.0	1.9 lbs.	\$1,399	Ni
Nikon AF 70-300mm f/4-5.6G	13/9	4.9 ft.	0.26X	62mm	2.9x4.6	15.0 oz.	\$172	Ni
Nikon AF-S VR 70-300mm f/4.5-5.6G IF-ED	17/12	4.9 ft.	0.25X	67mm	3.1x5.6	1.6 lbs.	\$589	Ni
Nikon AF 80-200mm f/2.8D ED	16/11	4.9 ft.	0.24X	77mm	3.4x7.4	2.9 lbs.	\$1,224	Ni
Nikon AF VR 80-400mm f/4.5-5.6D ED	17/11	7.5 ft.	0.42X	77mm	3.6x6.7	2.9 lbs.	\$1,849	Ni
Nikon AF-S 80-400mm f/4.5-5.6G ED VR	20/12	5.7 ft.	0.20X	77mm	3.8x8.0	3.5 lbs.	\$2,699	Ni
Nikon AF-S 200-400mm f/4G ED VR II	24/17	6.6 ft.	0.27X	52mm	4.9x14.4	7.4 lbs.	\$6,999	Ni
Sigma 50-500mm f/4.5-6.3 APO DG OS HSM	20/16	1.6 ft.	0.32X	95mm	4.1x8.6	4.3 lbs.	\$1,659	CaNiPeSiSo
Sigma APO 70-200mm f/2.8 EX DG OS HSM	22/17	4.6 ft.	0.13X	77mm	3.4x7.8	3.1 lbs.	\$1,399	CaNiSiSo
Sigma 70-300mm f/4-5.6 DG OS	16/11	4.9 ft.	0.26X	62mm	3.0x5.0	1.3 lbs.	\$359	CaNiPeSiSo
Sigma 120-300mm f/2.8 DG OS HSM / S	23/18	4.9 ft.	0.12X	105mm	4.8x11.5	7.5 lbs.	\$3,599	CaNiSi
Sigma 120-400mm f/4.5-5.6 DG APO OS HSM	21/15	4.9 ft.	0.24X	77mm	3.6x8.0	3.9 lbs.	\$999	CaNiPeSiSo
Sigma 150-500mm f/5-6.3 APO DG OS HSM	21/15	7.2 ft.	0.19X	86mm	3.7x9.9	4.2 lbs.	\$1,069	CaNiPeSiSo
Sigma 200-500mm f/2.8 APO EX DG	17/13	6.6 ft.	0.13X	72mm	9.3x28.6	34.6 lbs.	\$25,999	CaNiSi
Sigma 300-800mm f/5.6 EX DG APO HSM	18/16	19.7 ft.	0.14X	46mm†	6.2x21.3	12.9 lbs.	\$7,999	CaNiSi
Sony 70-200mm f/2.8G SSM	19/16	3.9 ft.	0.21X	77mm	3.4x7.7	3.0 lbs.	\$1,999	So
Sony 70-200mm f/2.8 G SSM II	19/16	4.0 ft.	0.21X	77mm	3.5x7.8	2.9 lbs.	\$2,999	So
Sony 70-300mm f/4.5-5.6 G SSM	16/11	3.9 ft.	0.25X	62mm	3.2x5.3	1.7 lbs.	\$999	So
Sony 70-400mm f/4-5.6 G SSM	18/12	4.9 ft.	0.27X	77mm	3.7x7.7	3.3 lbs.	\$1,999	So
Sony 70-400mm f/4-5.6 G II	18/12	4.9 ft.	0.27X	77mm	3.8x4.8	3.3 lbs.	\$2,199	So
Tamron SP 70-200mm f/2.8 Di	18/13	3.1 ft.	0.32X	77mm	3.5x7.6	2.5 lbs.	\$769	CaNiPeSo
Tamron SP 70-200mm f/2.8 Di VC USD	23/17	4.3 ft.	0.13X	77mm	3.4x7.4	3.2 lbs.	\$1,499	CaNiSo
Tamron 70-300mm f/4-5.6 Di	13/9	3.1 ft.	0.50X	62mm	3.0x4.6	15.3 oz.	\$199	CaNiPeSo
Tamron SP 70-300mm f/4-5.6 Di VC USD	17/12	4.9 ft.	0.25X	62mm	3.2x5.6	1.7 lbs.	\$449	CaNiSo
Tamron SP 150-600mm f/5-6.3 Di VC USD	20/13	8.9 ft.	0.20X	95mm	4.2x10.1	4.3 lbs.	\$1,069	CaNiSo
Tamron SP 200-500mm f/5-6.3 Di	13/10	8.2 ft.	0.20X	86mm	3.7x8.9	2.7 lbs.	\$949	CaNiSo
<b>For APS-C only (1.5X-1.6X focal-length factor):</b>								
Canon EF-S 55-250mm f/4-5.6 IS II	12/10	3.6 ft.	0.31X	58mm	2.8x4.3	13.8 oz.	\$299	Ca
Canon EF-S 55-200mm f/4-5.6 IS STM	15/12	2.8 ft.	0.29X	58mm	2.8x4.4	13.2 oz.	\$349	Ca
Nikon AF-S DX 55-200mm f/4-5.6G ED	13/9	3.1 ft.	0.29X	52mm	2.7x3.1	9.0 oz.	\$199	Ni
Nikon AF-S DX VR 55-200mm f/4-5.6G IF-ED	15/11	3.6 ft.	0.29X	52mm	2.9x3.9	11.8 oz.	\$249	Ni
Nikon AF-S DX 55-300mm f/4.5-5.6G ED VR	17/11	4.6 ft.	0.28X	58mm	3.0x4.8	1.2 lbs.	\$399	Ni
Pentax DA* 50-135mm f/2.8 ED (IF) SDM	18/14	3.3 ft.	0.17X	67mm	3.0x5.4	1.5 lbs.	\$1,524	Pe
Pentax DA 50-200mm f/4-5.6 ED	11/10	3.6 ft.	0.24X	52mm	2.6x3.1	9.2 oz.	\$249	Pe
Pentax DA 50-200mm f/4-5.6 ED WR	11/10	3.6 ft.	0.24X	49mm	2.7x3.1	10.1 oz.	\$249	Pe
Pentax DA 55-300mm f/4-5.8 ED	12/8	4.6 ft.	0.28X	58mm	2.8x4.4	15.5 oz.	\$429	Pe
Pentax HD DA 55-300mm f/4-5.8 ED WR	12/8	4.6 ft.	0.28X	58mm	2.8x4.4	1.0 lbs.	\$449	Pe
Pentax DA* 60-250mm f/4 ED (IF) SDM	15/13	3.6 ft.	0.15X	67mm	3.2x6.6	2.3 lbs.	\$1,899	Pe
Sigma APO 50-150mm f2.8 EX DG OS HSM	21/15	2.6 ft.	0.16X	77mm	3.4x7.8	3.0 lbs.	\$949	CaNiSi
Sony DT 55-200mm f/4-5.6 STM	13/9	3.1 ft.	0.29X	55mm	2.8x3.3	10.7 oz.	\$199	So
Sony DT 55-300mm f/4.5-5.6	12/9	4.5 ft.	0.27X	62mm	3.0x4.6	1.0 lbs.	\$299	So
<b>For Four Thirds System (2.0X focal-length factor):</b>								
Olympus Zuiko Digital ED 35-100mm f/2.0	21/18	4.6 ft.	0.09X	77mm	3.8x8.4	3.6 lbs.	\$2,499	4/3
Olympus Zuiko Digital ED 40-150mm f/4.0-5.6	12/9	2.9 ft.	0.14X	58mm	2.6x2.8	7.7 oz.	\$279	4/3
Olympus Zuiko Digital ED 50-200mm f/2.8-3.5 SWD	16/15	3.9 ft.	0.21X	67mm	3.4x6.2	2.2 lbs.	\$1,099	4/3
Olympus Zuiko Digital ED 70-300mm f/4.0-5.6	14/10	3.1 ft.	0.50X	58mm	3.1x5.0	1.4 lbs.	\$349	4/3
Olympus Zuiko Digital ED 90-250mm f/2.8	17/12	8.2 ft.	0.08X	105mm	4.9x10.9	7.2 lbs.	\$5,999	4/3

MFD: Minimum focusing distance  
Max. Magnif. (Maximum magnification): 1.0X equals life-size; 0.25X equals ¼ life-size (at the image plane)  
\* The EF 200-400mm f/4L has a built-in 1.4X teleconverter that can be activated when desired; when the converter is activated, the lens has 33 elements in 24 groups and a maximum magnification of 0.21X  
† Indicates filter is rear drop-in type, not front screw-on type  
Mounts: Ca = Canon EF; Ni = Nikon F; Pe = Pentax K; Si = Sigma SA; So = Sony A; 4/3 = Four Thirds System



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An aerial photograph of a surfer in a black wetsuit riding a wave. The surfer is positioned on the left side of the frame, moving towards the right. The wave is breaking, creating a large, white, foamy crest that dominates the lower half of the image. In the upper right background, a small drone with a camera is visible, hovering over the water. The water is a deep blue-green color.

This is the second in a series of articles on aerial imaging using drones. In this issue, we look at gimbals, FPV and aerial imaging techniques

TEXT AND PHOTOGRAPHY BY ERIC CHENG

# Get Above It All Part II

In the article about aerial imaging using drones in the December 2013 issue of *OP*, we discussed how to take your first pictures in the air using GoPro cameras and entry-level quadcopters like the DJI Phantom. In the last year, aerial imaging products have become accessible to just about everyone, providing opportunities to capture perspectives

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that were previously out of reach without large budgets. In this article, we'll talk about how to be successful in capturing images by using modified, mainstream quadcopters.

Virtually every multirotor aircraft with 8-inch or larger propellers is capable of lifting a GoPro camera, which is by far the most popular camera used in un-

manned aerial imaging because of its extraordinary quality to size-and-weight ratio. Homebuilt multirotors can easily be adapted to hold GoPros, and mainstream quadcopters like the Phantom actually come with GoPro mounts so they're ready to lift one right out of the box. This article will focus on the use of GoPro cameras in the air, but most

of the techniques and tips discussed can easily be applied to any camera you choose to put in the air, including the built-in camera in the new Phantom 2 Vision. For the purposes of this article, we'll refer to the original Phantom as "Phantom" and the new offering from DJI as the "Phantom 2 Vision."

Note also that, at the moment, just about anything you decide to change or add to an off-the-shelf quadcopter like the Phantom immediately thrusts you headfirst into the remote-control (RC) hobby world. Aerial imaging is developing very quickly, but we're currently only at the very edge of mainstream solutions.

## Image Integrity: Getting Rid Of Jello

All aircraft that use propellers have the potential to introduce high-frequency vibrations into camera systems. In the last article, we talked about artifacts that appear when the rolling shutter in the GoPro (and similar cameras) is subjected to these unwanted vibrations. Commonly called "jello," these artifacts cause annoying horizontal shearing in both video and still images.

To remove jello, you must eliminate the high-frequency vibrations, which can be accomplished by balancing all of the propellers and installing a vibration isolator between the camera and airframe. Prop balancing is relatively simple and is aided by special prop balancers that are sold in hobby shops and online. The basic idea is that a propeller should be perfectly balanced, meaning that both sides are the same weight. When a balanced propeller spins around its center, it doesn't introduce any vibrations into the system. Clear tape is often used to add weight to one side of a propeller, although using a file to remove material from the heavier side of a prop is also common.

Dedicated vibration isolators are also common and usually consist of four or more silicone balls that sit between the airframe and the camera mount. You can purchase or build a vibration isolator, but I recommend skipping this step altogether and getting a brushless gimbal, which includes built-in vibration isolators.

## Framing And Composition

The first time I put a camera up in the air on a quadcopter, I was elated, but I also felt totally blind. I was successfully taking aerial pictures and video, but I couldn't control the camera and couldn't see what it was capturing. To apply your photographic eye to aerial composition, you'll want two important upgrades to your aerial imaging rig.

The first is camera-orientation control. Fortunately, all gimbal controllers have this sort of control built in, and if you have a radio transmitter with an extra channel, all you need to do is connect an output from the flight controller or radio receiver to the appropriate input on the GCU. If you went with the Zenmuse and Phantom Upgrade Kit, you're in luck. The kit includes hardware to provide access to the transmitter channel that controls pitch (tilt-

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ing the camera up and down), and the Zenmuse gimbal will just work when you start using the new control on the transmitter. If you're mixing and matching your own hardware, you'll need to work out your own solution. Luckily, much of this is documented online, and with a bit of web research, you'll find instructions on how to do it (wiring and soldering skills are required). You can also have your local RC dealer do the installation for you.

The second part of successful aerial composition is real-time framing via a video signal from your multirotor's camera. This is commonly called "first-person view" (FPV), and the incoming

video signal is displayed on LCD monitors (typically, 7 to 10 inches) or LCD glasses, allowing a pilot to fly as if he or she was looking out of the front of the aircraft. Flying FPV is very similar to playing a video game using a joystick, and it's not uncommon to feel like your aircraft is a flying avatar capable of capturing images from anywhere!

Getting an FPV setup working can be complicated, but the principles are simple. Find your camera's analog video-out signal and connect it to a video transmitter (websites like ReadyMadeRC sell GoPro cables for this purpose). On the receiving end, use a compatible video receiver, and plug its video output into

*The future is bright for aerial imaging using small unmanned aircraft systems. With just a little bit of effort, a photographer can have a flying, stabilized camera with a real-time video feed coming out of it. There's still a learning curve, and any new drone pilot will experience setbacks and frustrations, but this is an exciting new world for enthusiasts.*

your chosen display device. Common consumer brands for FPV are Fatshark and ImmersionRC, and companies like DJI also offer FPV solutions.

Both of these aircraft upgrades are currently firmly planted in the hobby world. It can take a lot of research to understand how exactly to perform these modifications yourself, but if you enjoy building things, it can also be a lot of fun. As mentioned previously, you can also just buy an off-the-shelf dealer package that incorporates everything we've talked about so far.

#### Settings For Success

Once your aerial imaging platform is set up for FPV and vibration-free image capture, you're ready to begin to optimize the images captured by your flying camera. One reminder about aerial imaging is that piloting skill is absolutely the most important variable in the equation. This will likely change in the future, as aerial platforms focus more and more on autonomy and safety, but in the near future, your images are only going to be as good as your piloting skills are. Practice safely, and practice often.

Capturing still images using a GoPro on a Phantom is straightforward, since there aren't very many options you can set. I commonly use my GoPro HERO3 Black Edition in time-lapse mode at 2-second intervals. This gives me hundreds of pictures per flight, but storage is cheap, and I'm happy to throw away most of the images that are captured, keeping only the best. The other reason 2 seconds is the magic number is that the GoPro won't output real-time video when it's shooting at 0.5- or 1-second intervals. Shoot any faster than 2-second intervals, and FPV goes dark.

Getting good exposures from an aerial GoPro can be tricky at certain times of day. Shooting midday in bright, sunny conditions doesn't usually pose a problem, but if it's cloudy, the dynamic range necessary to capture both sky and

#### Accessories

Two accessories are especially useful for aerial imaging using multirotors. **The first is a polarizer for your aerial camera**, which is particularly helpful if you're shooting over water. You have to be careful when adding accessories and using a gimbal because gimbals are designed to work with perfectly balanced loads. Putting an accessory lens on a GoPro, for example, moves the center of gravity, which strains the gimbal's motors. In extreme cases, this can cause motor burnout. Because of this constraint, I recommend using the lightest polarizer possible. For GoPro cameras, a product called LayerLens combined with a circular-polarized lens replacement is the perfect solution. At 7.5 grams in weight, it barely adds any weight to the camera, and I've done numerous flights without any problem from my gimbal. Having said that, you should be aware that these gimbals don't officially support modified GoPro cameras, so you'll be using accessory lenses at your own risk.

**The second must-have accessory is a replacement charger for your multirotor's batteries.** Many chargers are DC-only, requiring a DC power supply to work, but I recommend getting a charger that accepts both AC and DC so you can just plug it into your wall. Optionally, you can use a car battery or other 12V power source if you want to charge in the field. The HITEC X4 AC Plus 4 Port AC/DC Multi-Charger is excellent, charging up to four batteries simultaneously and supporting storage charging, a recommended voltage level for safe, long-term LiPo battery storage.



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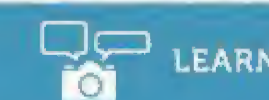


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## Image Stability: The Rise Of The Brushless Gimbal

**G**imbals are special mounts that rotate a camera around one or more axes, most often for stabilization. A camera mounted directly onto a multirotor is certainly capable of capturing still images and video, but the camera's orientation will be tied directly to the orientation of the aircraft. In this configuration, it's nearly impossible to keep the horizon straight, and video footage will be shaky as the multirotor automatically stabilizes itself in the air.

For many years, gimbals in the RC hobby world used servos in order to rotate cameras around pivots, but in mid-2013, brushless motors were adapted for consumer gimbals. The rise of the inexpensive brushless gimbal has been an incredible thing to behold and is an example of how fast this space is evolving.

Brushless gimbals for small cameras are typically 2-axis gimbals, which means they stabilize a camera in roll and pitch directions, leaving only yaw unstabilized; 3-axis gimbals exist, but typically

have only been used in large-camera applications. Luckily, 2-axis stabilization is sufficient to keep the horizon level and in the same vertical location in the frame. The way a brushless gimbal stabilizes a camera is very similar to the way a multirotor stabilizes itself in the air. Sensors on a chip are mounted on the camera platform and report movements to a gimbal controller, which tells the gimbal's brushless motors to counter the detected movement. This happens many times a second, and in practice, video recorded using cameras on brushless gimbals looks like it was captured using a floating Steadicam.

DJI makes a gimbal called the **Zenmuse H3-2D**, which is designed for **GoPro HERO3** and **HERO3+** cameras (which are identical in shape when outside of the underwater housing). Although the Zenmuse can be attached to any platform, it works particularly well on the **Phantom** and is shallow enough to be used with the stock landing struts. The Zenmuse H3-2D requires a power management unit (**DJI Naza PMU v2**, \$65) and gimbal control unit (GCU, included with gimbal), but if you're flying a Phantom, you can also purchase the **Phantom Upgrade Kit**, a \$69 replacement main board with integrated PMU and GCU. This saves a huge amount of weight, and when used with the replacement board, the Zenmuse H3-2D is the smallest, lightest brushless gimbal you can get for a GoPro. Small gimbal size is important because every third-party GoPro gimbal I've seen requires raising the body of the Phantom for gimbal clearance, which is done by altering the existing landing gear or by replacing it with a third-party solution. My favorite replacement landing gear is the **Simensays Landing Gear**, which is 3D-printed and sold by **Shapeways** for around \$40. The Simensays Landing Gear is designed to use any 6mm tube as legs, so you can purchase your own carbon-fiber tubes and cut them to your desired lengths.

Six months after the Zenmuse H3-2D was announced in April 2013, the market was flooded with inexpensive 2-axis brushless gimbals. At the time of writing, the Zenmuse H3-2D costs \$699 (without PMU or Phantom Upgrade Kit), and decent third-party gimbals like the **Tarot T-2D** can be purchased for \$200. All current gimbals require soldering and complex installation, but many dealers will do the installation for you or sell you a quadcopter package with a gimbal preinstalled.

ground is too large for GoPros (and most cameras on the market). In this case, angle your camera down to get the camera to expose for the ground. You'll blow out the sky, but your subject is most likely terrestrial, and you'll probably want to optimize for that.

New quadcopters like the Phantom 2 Vision have integrated cameras, which allow for camera control during flight. The well-designed iOS app for the Vision lets users switch between still and video modes, start and stop the camera, set exposure, and more. It's a little awkward to have to remove one's hands from the sticks in order to adjust the camera and take a picture, but one can either have a second person control the camera or set the camera to video/time-lapse mode and focus on flying. Note that the Phantom 2 Vision's gimbal is pitch-only and uses a servo. This effectively makes it a composition tool (camera angle up and down) and not a stabilization tool.

In the previous article in this series, I recommended shooting video at 60p (frames per second) to minimize jello.

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However, if you've balanced your props and are using properly tuned vibration isolation to mount your gimbal, you should have no jello in your video, even at 24p. It's important to note that some tuning still may be required even in ready-to-fly solutions. Almost all gimbal manufacturers ship gimbals with multiple vibration isolators, suggesting that there's no catch-all solution to eliminating jello. In my case, I had to swap out the silicone balls in my Zenmuse H3-2D gimbal with softer ones (included) before jello disappeared from my setup, even though my propellers are perfectly balanced.

In my aerial video pursuits, I typically set my GoPro for Protune with manual white balance in one of the following video modes: 2.7k/30p Wide, 1080/60p Wide or 1080/30p Medium. I like the

less-distorted look of Medium FOV, but shooting in 2.7k is flexible because I can crop and still have plenty of data to output 1080p. I shoot at 60p when I want to slow down footage a lot in post, but even at 30p, you can slow footage down to 24p, which is a pleasing effect. OP



*Eric Cheng is an award-winning underwater photographer, publisher and technologist. Caught between technical and creative worlds, Cheng holds bachelor's and master's degrees in computer science from Stanford University, where he also studied classical cello performance. He's the founder of [Wetpixel.com](http://Wetpixel.com), the premiere community website for underwater image makers. See more of his work at [echengphoto.com](http://echengphoto.com) and [skypixel.org](http://skypixel.org).*

### MORE On The Web

Go to the OP website at [www.outdoorphotographer.com](http://www.outdoorphotographer.com) to see the first article in this series, "Get Above It All" by Eric Cheng.



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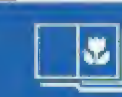
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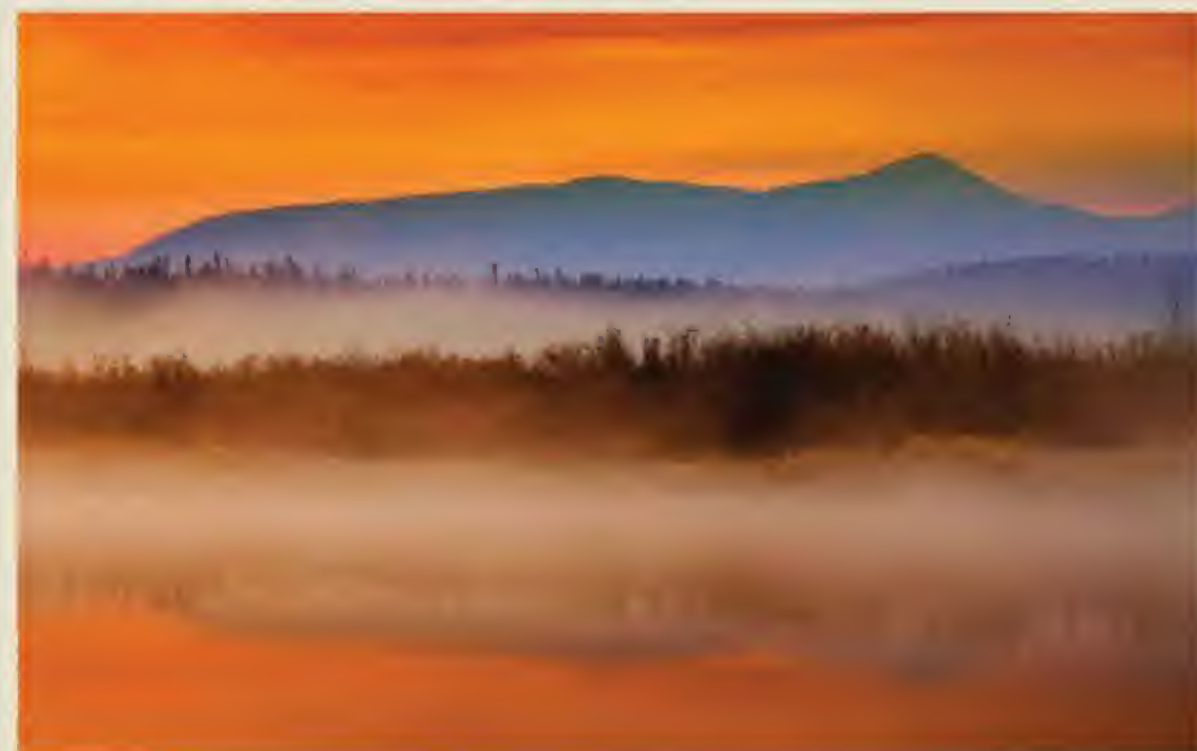


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For more information, contact: Russ Burden Nature Photography Tours, (303) 791-9997, [rburden@ecentral.com](mailto:rburden@ecentral.com), [www.russburdenphotography.com](http://www.russburdenphotography.com).

## Scenic Aperture Workshops Autumn 2014

Scenic Aperture's 2014 autumn workshop lineup is focused in the four-corners region of the American South-

west. Scheduled workshops include SW Colorado Autumn Color, Arches and Canyonlands, and Bosque del Apache. Scenic Aperture's photography workshops provide individualized training and exciting opportunities to photograph North America's most beautiful areas. Workshops include both classroom and in-field instruction. They provide meaningful learning opportunities for photographers of every skill level. Their focus is on you! These workshops are designed to help you develop skills and knowledge about the creative and technical aspects of photography. They show you how to take control of your camera. Workshops are both exhausting and exhilarating. Your days are long, and you work hard to take advantage of your time together. They'll push you to have fun, develop your creativity and create beautiful images of which you can be proud.

For more information, contact: Scenic Aperture, (970) 403-5853, [hello@scenicaperture.com](mailto:hello@scenicaperture.com), [www.scenicaperture.com](http://www.scenicaperture.com).

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many of the significant outer islands, affording students the greatest diversity of wildlife. Schedules are planned to maximize both wildlife observation and photographic opportunities, including "best-light" early morning and late afternoon outings. All excursions are accompanied by both a Naturalist Guide and a Tour Leader. Some are led by award-winning wildlife photographer Tui De Roy.

For more information, contact: Galápagos Travel, (800) 969-9014, [info@galapagostravel.com](mailto:info@galapagostravel.com), [www.galapagostravel.com](http://www.galapagostravel.com).

## Explore Mount Rainier August 4 to 8, 2014

Landscapes, wildflowers, waterfalls, magnificent mountains, trees, mood, color, beauty. What more could you ask for on a photo trip? All of this will be on display in front of you on this workshop to one of the most recognizable mountains in the country. You'll see all the highlights of the park, including Reflection Lakes, Paradise Valley, Grove Of The Patriarchs, Box Canyon and more. But the exciting stuff comes when you visit places you probably wouldn't visit on your own on a trip to the area. Paradise Meadows is known for its spectacular wildflower displays. The blooms generally start in late July and peak in mid-August, thus the timing of this trip. Emphasis will be placed upon learning creative landscape and macro techniques, with lots of field instruction being the emphasis on this trip. There's a planned late night shoot for some Milky Way and star trails shooting with Mount Rainier prominently featured.

For more information, contact: First Light Photo Workshops, (303) 601-2828, [andy@firstlighttours.com](mailto:andy@firstlighttours.com), [www.firstlighttours.com](http://www.firstlighttours.com).



Andy Long

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For more information, contact: Susi Allison-Lama, Wild India LLC, (314) 925-8380, [wildindia@swbell.net](mailto:wildindia@swbell.net), [www.butchlama.com](http://www.butchlama.com).

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For more information, contact: Rocky Mountain Outdoor Writers and Photographers, (217) 714-2905, [photo.workshop@rmowp.org](mailto:photo.workshop@rmowp.org).

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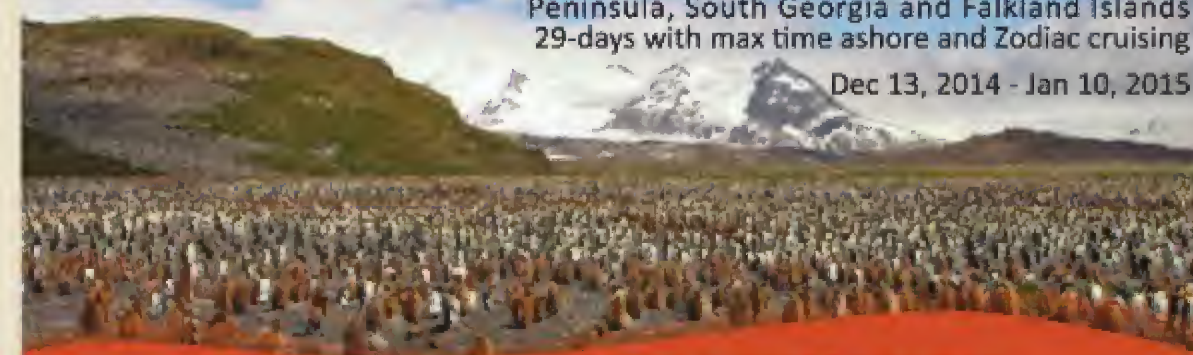
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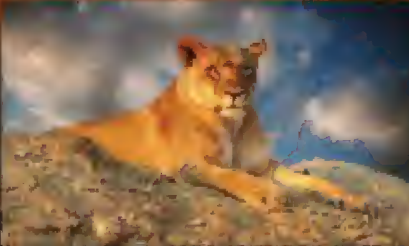
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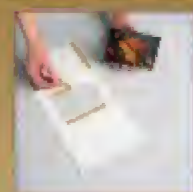
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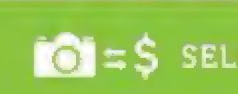
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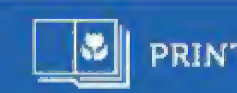
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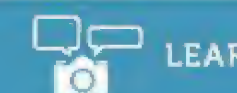
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# LENS Alignment

When using longer telephotos, be sure your camera and lenses are adjusted properly for each other

Most photographers take it for granted that their lenses and their cameras are in perfect alignment with one another, and that they'll perform with complete accuracy. With shorter focal lengths, the tolerances are such that any misalignment will be disguised, but with longer focal lengths, problems are more pronounced, and soft images will be the result.

The fact is, perfect alignment out of the box isn't as likely as you'd think. Even brand-new pro-series lenses can show some imperfections. Fortunately, these imperfections are easily corrected with some simple adjustments made through the camera's menu system if you have a higher-end DSLR.

You can test and correct for misaligned lenses with a simple homemade setup, but there are commercially made systems that are inexpensive, easy to use and very effective. The LensAlign is a favorite for many pros due to its accuracy and the way its two-part target works. The LensAlign has a target that's parallel to the image plane (the sensor) and a ruler that runs at an angle. Your DSLR focuses on the target and you shoot a photo, then you review the photo to confirm the lens alignment.

The trick with any lens alignment testing is in making sure all of the elements in the system are properly oriented with each other. The target and the image plane need to be exactly parallel to each other. Here's another area where the commercially available alignment tools have an advantage. Using the LensAlign as an example again, it has what the company calls the True Parallel Alignment feature.

With the target and the measuring tool set up, position the camera at a normal shooting distance for the lens. Some manufacturers suggest 50x the

focal length. A good rule of thumb is approximately 25x the focal length, and if your lens is a zoom, do everything from the maximum focal length. For a 70-200mm, try racking out the lens to 200mm and set the target about 16 to 17 feet away (25x200mm = 5000mm, which is just under 16.5 feet). Everything should be firmly mounted on tripods. Set your lens at its sharpest aperture, or just set  $f/8$  if you aren't sure where the lens is sharpest. Photograph the target. When you review the image, you can do it on the DSLR's LCD, but it's best to do it on a larger screen. After all, we're going for precision here.

When you're looking at the image on your computer screen, the target should be sharp. If it's not, this usually means the camera didn't properly lock onto the target for some reason. Try shooting again. If the target is sharp, you'll notice one of

three possibilities with the ruler component: 1) The zero is tack-sharp, and the focus trails off evenly in front and behind it, indicating that your system is perfectly aligned; 2) The zero is sharp, but the focus trails off more abruptly in front than behind the zero and 3) The zero is sharp, but the focus trails off more abruptly behind than in front. Either of the latter situations indicate you need to make an adjustment.

Higher-end cameras allow you to adjust the back focus to correct for the problem. In the menu, you'll find a custom function that controls the micro-adjustment of the focus. This varies depending on the camera. Check your camera's manual for specifics. Not all DSLRs allow for this kind of adjustment, but most *OP* readers are likely to have models that offer micro-adjustments.

It's a good idea to repeat this procedure with all of your lenses and bodies. Once you've gone through the test procedure with a camera and lens, it will be learned by the DSLR, and when you attach that lens to the camera in the future, the adjustment will be set automatically. However, this is true with a lens model, not a specific model. In other words, if you rent a 400mm  $f/4$  for a special trip and you test the lens, the adjustments you make will take effect anytime that 400mm is attached to your camera during the trip. If you rent a different 400mm  $f/4$  later, your DSLR will make the adjustment from the previous 400mm. In the case of rentals, make sure you test and dial in the adjustments with each lens. **OP**



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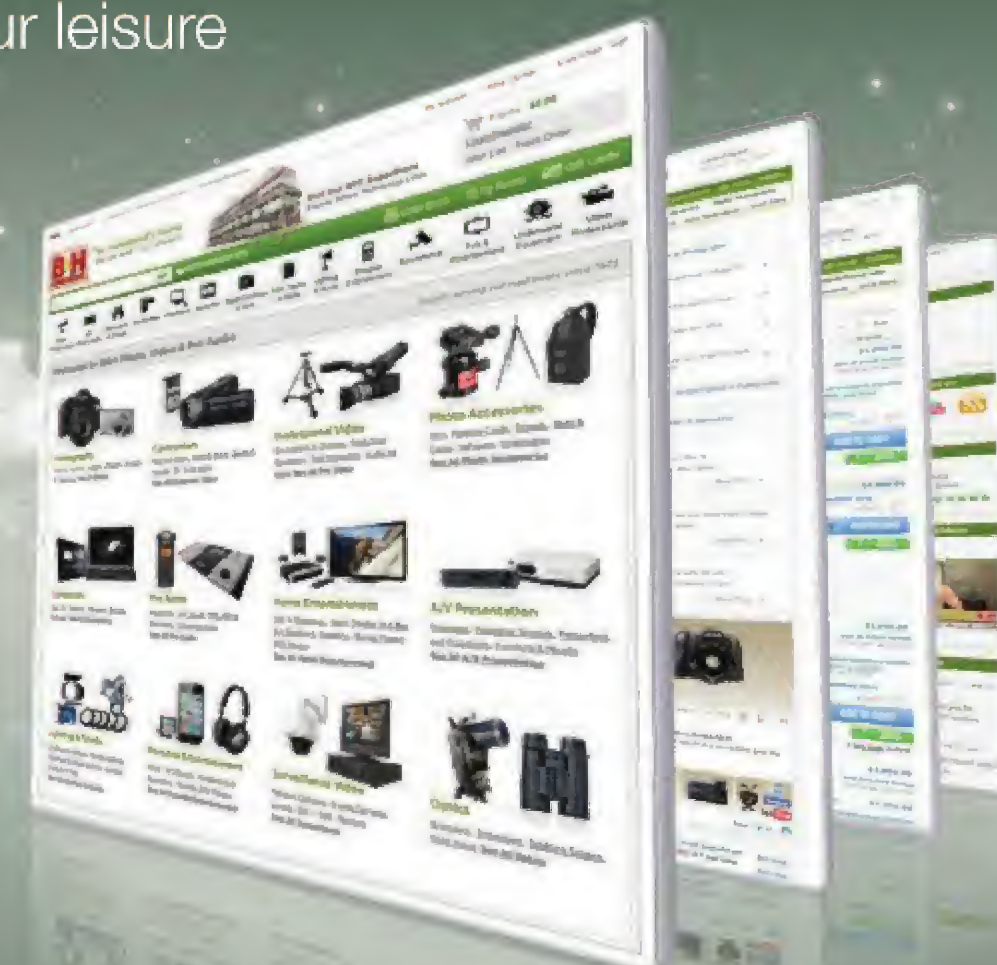
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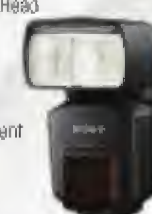
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Carl Zeiss T\* DT Digital Lens

- Designed exclusively for Digital SLRs
- Ideal for snapshots, portraits, interiors, or outdoor scenery
- 35mm equiv: 24-120mm
- Min. focus: 13.8"
- 62mm filter diameter
- Weight: 15.6 oz



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### Canon Digital Rebel T5i DSLR

- 3.0" Vari-Angle Touchscreen LCD
- Uses Canon EF Lenses (1.6x factor)
- SD/SDHC/SDXC Card Slot
- STM Lens Support for Quiet AF in Movies
- Full HD 1080 Video with Continuous AF
- ISO 100-12800, Expandable to 25600



Rebates Expire 3.1.14	Price	Rebate	Final Cost
Body Only #CAEDT5i	699.99	\$50	649.99
Kit with 18-55mm IS STM #CAEDT5iK	849.99	\$50	799.99
T3 Kit with 18-55mm IS #CAEDT3iK	449.99	—	—
T3i Kit with 18-55mm IS #CAEDT3iK	599.99	—	—

### Canon EOS-70D DSLR

- Dual Pixel CMOS AF with Live View
- DIGIC 5+ Image Processor
- SD/SDHC/SDXC Card Slot
- Uses Canon EF & EF-S Lenses
- 3.0" Vari-Angle Touchscreen
- 7 fps Continuous Shooting
- Built-In Wireless Connectivity
- Full HD 1080p Video



Rebates Expire 3.1.14	Price	Rebate	Final Cost
Body Only #CAE70D	1199.00	—	—
Kit with 18-55mm STM #CAE70D1855	1349.00	—	—
EOS 60D Body Only #CAE60D	899.99	\$200	699.99
EOS 60D Kit with 18-135mm IS #CAE60D18135	1199.00	\$200	999.00

### Canon EOS-7D DSLR

- Record HD Video • 3" LCD
- Uses Canon EF Lenses
- Dust and Weather Resistant
- CF Card Slot • Selectable Video Exposure and Frame Rates
- ISO 100-6400 (expandable to 12800) • 8 fps Burst Mode
- 19-Point, All Cross-Type AF System



Body Only #CAE7D	1499.00
Kit with 18-135mm IS #CAE7D18135	1799.00
Kit with 28-135mm IS #CAE7D28135	1699.00

### Canon EOS-6D DSLR

- Full-Frame CMOS Sensor • 3.0" LCD
- DIGIC 5+ Image Processor
- Uses Canon EF Lenses
- SD/SDHC/SDXC Card Slot
- Built-In Wi-Fi and GPS Connectivity
- Full HD 1080p with Manual Controls
- Extended ISO Range of 50-102400
- Up to 4.5 Full Resolution FPS
- Built-In HDR & Multiple Exposure Modes



Body Only #CAE6D	1899.00
Kit with 24-105mm f/4 L #CAE6D24105	2499.00

### Canon EOS-5D Mark III DSLR

- 3.2" Clear View High Resolution LCD
- DIGIC 5+ Image Processor
- 61-Point High Density AF
- Uses Canon EF Lenses
- Dual CF, SD Card Slots
- Full HD 1080/30p and 720/60p Formats
- Extended ISO Range (50-102400)
- Built-In HDR & Multiple Exposure Modes



Body Only #CAE5D3	3399.00
Kit with 24-105mm LIS #CAE5D324105	3999.00

### Canon EOS-1Dx DSLR

- Dual DIGIC 5+ Image Processors
- Magnesium Alloy Body
- Eye-Level Pentaprism Viewfinder
- 3.2" LCD Monitor
- Uses Canon EF Lenses
- Dual CF card slots
- 1920 x 1080 HD Video Capture
- Live View Still and Video Recording
- 61-Point High Density Auto Focus



Body Only #CAE1DX	6799.00
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### Nikon D3300 DSLR

- EXPEED 4 Image Processor
- Full HD 1080p Video Recording
- 3.0" LCD • 5 fps Shooting
- Uses Nikon AF Lenses (1.5x factor)
- SD/SDHC/SDXC Card Slot
- Expandable ISO 25600
- Easy Panorama Mode and Guide Mode
- Nikon Inc. limited warranty included



D3300 is available in Black, Gray or Red	Price	Rebate	Final Cost
Kit with 18-55mm VR II #NID33001855	646.95	—	—
D3200 Kit Black w/18-55mm VR #NID32001855	599.95	\$100	499.95
D3100 Kit with 18-55mm VR #NID31001855	429.95	—	—

### Nikon D5200 DSLR

- EXPEED III Image Processor
- Full HD Video with Full-Time Servo AF
- 3.0" Vari-Angle LCD • Live View
- Uses Nikon AF Lenses (1.5x factor)
- SD/SDHC/SDXC Card Slot
- 39-Point AF System with 9 Cross-Type
- Nikon Inc. limited warranty included



Rebates Expire 3.1.14	Price	Rebate	Final Cost
D5200 is available in Black, Bronze or Red	896.95	—	—
Kit with 18-55mm VR #NID52001855	896.95	\$150	746.95
D5300 Body Only #NID5300	796.95	—	—
D5300 Kit with 18-55mm VR II #NID53001855	896.95	—	—

### Nikon D7100 DSLR

- Magnesium Alloy Body
- Moisture Resistant
- EXPEED 3 Image Processor
- 1080p Full HD Video Capture
- Accepts Nikon AF Lenses (1.5x factor) • 3.2" LCD
- Dual SD/SDHC/SDXC Card Slots
- Built-In Flash with Commander Function
- Nikon Inc. limited warranty included



Body Only #NID7100	1199.95	\$50	1149.95
Kit with 18-105mm VR #NID710018105	1599.95	\$150	1449.95
D7000 Body Only #NID7000 B&H SPECIAL!	899.00	\$200	699.00

### Nikon D610 DSLR

- FX-Format (Full-Frame) CMOS Sensor
- Uses Nikon AF Lenses • 3.2" LCD
- EXPEED 3 Image Processor
- SD/SDHC/SDXC Card Slot
- 6 fps Continuous Shooting
- Expandable Sensitivity to ISO 25600
- Full HD 1080p Video Recording at 30 fps
- Multi-CAM 4800 AF Sensor with 39 Points
- Nikon Inc. limited warranty included



Rebates Expire 3.1.14	Price	Rebate	Final Cost
Body Only #NID610	1996.95	—	—
Kit with 24-85mm VR Lens #NID6102485	2596.95	\$300	2296.95

### Nikon D800 DSLR

- 35.9x24mm CMOS FX-Format Sensor
- 3.2" LCD Monitor
- Optical Low-Pass Filter
- CF & SD Dual Card Slots
- Nikon F Mount Lens Mount
- Eye-Level Pentaprism Viewfinder
- 1920 x 1080/30/25/24p HD Video
- Matrix/Center-Weighted/Spot Metering
- Nikon Inc. limited warranty included



Rebates Expire 3.1.14	Price	Rebate	Final Cost
Body Only #NID800	2906.95	\$200	2796.95
D800E Body Only #NID800E	3206.95	—	—

### Nikon D4 DSLR

- RAW, TIFF, JPEG, RAW+JPEG Files
- FX-format (full-frame) CMOS Sensor
- 1080p HD Broadcast Quality Video
- EXPEED3 Image Processor
- 3.2" LCD Screen with Live View
- Compatible with Most Nikkor Optics
- Matrix, Center-Weighted, Spot Metering • 100-12800 ISO
- CF Type 1 & XQD Compatible
- Nikon Inc. limited warranty included



Body Only #NID4	5996.95
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### Canon SLR Lenses and Flashes

Call for Available Rebates & Promotions

#### EOS Flash System

270EX II	169.99
320EX	—
430EX II	299.99
600EX-RT	549.99
MR-14EX Ringlight	—
MT-24EX Twin Flash	829.99



#### EF-S Digital Lenses

(Not compatible with full frame cameras)

60/2.8 USM Macro (52ø)	469.99
10-22/3.5-4.5 USM (77ø)	649.99
15-85/3.5-5.6 IS USM (72ø)	799.99
17-55/2.8 IS USM (67ø)	879.99
17-85/4-5.6 IS USM (67ø)	—
18-55/3.5-5.6 IS (58ø)	199.99
18-135/3.5-5.6 IS (67ø)	499.99
18-200/3.5-5.6 IS (72ø)	699.99
55-250/4-5.6 IS USM (58ø)	299.99
55-250/4-5.6 IS STM (58ø)	349.00



#### EF Lenses

20/2.8 USM (72ø)	539.99
24/2.8 IS USM (58ø)	599.99
28/1.8 USM (58ø)	509.99
28/2.8 IS USM (58ø)	549.99
35/2 IS USM (67ø)	599.99
40/2.8 STM Pancake (52ø)	199.99
50/1.8 II (52ø)	125.99
50/2.5 Macro (52ø)	299.99
50/1.4 USM (58ø)	399.99
MP-E 65/2.8 1x-5x Macro (58ø)	1049.00
85/1.8 USM (58ø)	419.99
100/2 USM (58ø)	499.00
100/2.8 USM Macro (58ø)	599.99
28-135/3.5-5.6 IS USM (72ø)	479.99
70-300/4-5.6 IS USM (58ø)	649.99
70-300/4.5-5.6 DO IS USM (58ø)	—
75-300/4.0-5.6 III (58ø)	199.99
75-300/4.0-5.6 III USM (58ø)	—



#### TS-E "L" MF Lenses

17/4.0 L	2499.00
24/3.5 L II	2199.00
45/2.8	1399.00
90/2.8	1399.00

#### EF "L" Lenses

14/2.8 USM II	2359.00
24/1.4 II (77ø)	1749.00
35/1.4 USM (72ø)	1479.00
50/1.2 USM (72ø)	1619.00
85/1.2 USM II (72ø)	2199.00
100/2.8 IS USM Macro (67ø)	1049.00
135/2.0 USM (72ø)	1089.00
180/3.5 USM Macro (72ø)	1579.00
200/2.8 USM II (72ø)	819.99
200/2.0 IS USM (52ø)	—
300/4.0 IS USM (77ø)	1449.00
300/2.8 IS USM II (52ø rear)	—
400/5.6 USM (77ø)	1339.00
400/2.8 IS II (52ø rear)	—
500/4 IS USM II (52ø rear)	—
600/4.0 IS II (52ø rear)	—
8-15/4.0 Fish-eye USM	1499.00
16-35/2.8 USM II (82ø)	1699.00
17-40/4.0 USM (77ø)	839.99
24-70/4.0 IS USM (77ø)	1499.00
24-70/2.8 II USM (82ø)	2299.00
24-105/4 IS USM (77ø)	1149.00
28-300/3.5-5.6 IS USM (77ø)	—
70-200/4.0 USM (67ø)	709.99
70-200/4.0 IS USM (77ø)	1349.00
70-200/2.8 USM (77ø)	1449.00
70-200/2.8 IS II USM (77ø)	2499.00
70-300/4.0-5.6 IS USM (67ø)	1599.00
100-400/4.5-5.6 IS USM (77ø)	1699.00

#### EF "L" Teleconverters

1.4x III	499.99
2x III	499.99

### Nikon SLR Lenses and Flashes

Nikon Instant Savings on Lenses & Speedlites with purchase of any Nikon DSLR

AF Flashes	Price	Rebate	Final
SB-300	146.95	—	—
SB-700	326.95	—	—
R1C1 Wireless Twin Flash System	—	—	—



DX ED-IF Lenses for Digital Only	Price	Rebate	Final
10.5/2.8 Fish-Eye	—	—	—
35/1.8 G AF-S (52ø)	196.95	—	—
40/2.8 G AF-S Micro (52ø)	276.95	—	—
85/3.5 G ED VR Micro	526.95	\$100	426.95
10-24/3.5-4.5 G AF-S (77ø)	—	—	—
12-24/4 G AF-S (77ø)	—	—	—
16-85/3.5-5.6 G AF-S VR (67ø)	—	—	—
17-55/2.8 G AF-S (77ø)	—	—	—
18-55/3.5-5.6 G AF-S II (52ø)	—	—	—
18-55/3.5-5.6 G AF-S VR (52ø)	196.95	—	—
18-55/3.5-5.6 G AF-S VR II (52ø)	246.95	—	—
18-105/3.5-5.6 G AF-S VR *	396.95	\$100	296.95
18-140/3.5-5.6 G AF-S VR **	596.95	\$300	296.95
18-200/3.5-5.6 G AF-S VR II	846.95	\$250	596.95
18-300/3.5-5.6 G AF-S ED VR (77ø)	996.95	—	—
55-200/4-5.6 G AF-S (52ø)	—	—	—
55-200/4-5.6 G AF-S VR	246.95	\$100	146.95
55-300/4.5-5.6 G AF-S VR	396.95	\$150	246.95



D-Type AF Lenses	Price	Rebate	Final
14/2.8 D ED	—	—	—
16/2.8 D (39ø) with Hood	—	—	—
20/2.8 D (62ø)	—	—	—
24/2.8 D (52ø)	—	—	—
24/1.4 G AF-S ED (77ø)	—	—	—
24/3.5 D ED PC-E (77ø)	—	—	—
28/1.8 G AF-S (67ø)	696.95	—	—
28/2.8 D (52ø)	—	—	—
35/2.0 D (52ø)	—	—	—
35/1.4 G AF-S ED (67ø)	—	—	—
35/1.8 G AF-S ED (58ø)	—	—	—
45/2.8 D ED PC-E Micro (77ø)	—	—	—
50/1.8 D (52ø)	—	—	—
50/1.8 G AF-S (58ø)	216.95	—	—
50/1.4 D (52ø)	—	—	—
50/1.4 G AF-S (58ø)	—	—	—
58/1.4 G AF-S (72ø)	1696.95	—	—



D-Type AF Lenses	Price	Rebate	Final
60/2.8 D Micro (62ø) (1:1)			
60/2.8 G AF-S ED Micro (62ø)			
85/1.8 D (62ø) with Hood			
85/1.8 G AF-S (67ø)	496.95		
85/1.4 D IF (77ø)			
85/1.4 G AF-S (77ø)			
85/2.8 PC-E Micro (77ø)			
105/2.8 G AF-S ED-IF VR Micro (62ø)			
105/2.0 DC D with Hood (72ø)			
180/2.8 D ED-IF (72ø)			
200/4 D ED-IF Micro with Case (62ø)			
200/2 G AF-S ED-IF VR II (52ø)			
300/4.0 D AF-S ED-IF (77ø)			
300/2.8 G AF-S VR (52ø-IF)			
400/2.8 G AF-S VR ED (52ø)			
500/4.0 G AF-S VR ED (52ø)			
14-24/2.8 G AF-S ED-IF	1996.95		
16-35/4.0 G AF-S ED VR (77ø)	1256.95		
17-35/2.8 D AF-S ED-IF (77ø)			
18-35/3.5-4.5 AF-S G ED (77ø)	746.95		
24-70/2.8 G AF-S ED-IF (77ø)	1886.95		
24-85/2.8-4.0 D IF (72ø)			
24-85/3.5-4.5 G AF-S ED VR ***	596.95	\$100 <sup>a</sup>	496.95
24-120/4.0 G AF-S ED VR (77ø)	1296.95		
28-300/3.5-5.6 G AF-S ED VR	1046.95	\$150 <sup>a</sup>	896.95
70-200/4.0 G AF-S ED VR (67ø)	1396.95		
70-200/2.8 G AF-S ED-IF VR II (77ø)	2396.95		
70-300/4.0-5.6 G (62ø)			
70-300/4.5-5.6 G-AFS VR	586.95	\$200 <sup>a</sup>	386.95
80-200/2.8 D with Collar (77ø)			
80-400/4.5-5.6 D VR (77ø)			
80-400/4.5-5.6 G AF-S ED VR (77ø)	2696.95		
200-400/4 G AF-S ED VR II (52ø)			
TC-14E II (1.4x) Teleconverter			
TC-17E II (1.7x) Teleconverter			
TC-20E III (2x) Teleconverter			





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C = Canon N = Nikon P = Pentax SM = Sony/Minolta SE = Sony E Mount		** Price After Rebate Expires 3.31.14		
	SKU #	Available for	Rebate	Price
Di-II	60mm f/2.0 LD IF Macro (55d)	#1A6020I* C, N, SM	—	524.00
Di	90mm f/2.8 Macro (55d)	#1A9020M* C, N, P, SM	—	499.00
Di	90mm f/2.8 SP Macro VC USD (58d)	#1A9028VC* C, N, SM	—	749.00
Di	180mm f/3.5 LD IF Macro (72d)	#1A18035* C, N, SM	—	739.00
Di-II	10-24mm f/3.5-4.5 (77d)	#1A102435* C, N, P, SM	—	499.00
Di-II	17-50mm f/2.8 XR LD IF Aspherical (67d)	#1A175028* C, N, P, SM	—	499.00
Di-II	17-50mm f/2.8 XR VC LD IF Asph. (67d)	#1A175028*Q C, N	—	649.00
Di-II	18-200mm f/3.5-6.3 (62d)	#1A1820035* C, N, P, SM	\$20	179.00**
Di-III	18-200mm f/3.5-6.3 VC (62d) Black or Silver	#1A1820035* SE	—	739.00
Di-II	18-270mm f/3.5-6.3 VC PZD (62d)	#1A18270* C, N, SM	\$50	399.00**
Di	24-70mm f/2.8 VC USD (82d)	#1A247028* C, N, SM	—	1299.00
Di	28-75mm f/2.8 XR (67d)	#1A287528* C, N, P, SM	—	499.00
Di	28-300mm f/3.5-6.3 XR LD (62d)	#1A2830035XD* C, P, SM	—	419.00
Di	28-300mm f/3.5-6.3 XR VC (62d)	#1A2830035* C, N	—	629.00
Di	70-200mm f/2.8 SP VC USD (77d)	#1A7020028* C, N, SM	—	1499.00
Di	70-300mm f/4.0-5.6 VC USD (62d)	#1A70300* C, N, SM	\$100	349.00**
Di	200-600mm f/5.6-6.3 LD IF (86Cd)	#1A2006005* C, N, SM	—	949.00
	1.4x SP AF Pro Teleconverter	#1A14XP* C, N	—	224.00
	2x SP AF Pro Teleconverter	#1A2XP* C, N	—	254.00

▶ Tokina AF LENSES		DX - for Digital SLRs Only	FX - Designed for full frame DSLRs	Price
Canon EOS	Nikon AF			
FX 100mm f/2.8 Pro D Macro (52d)	#T010028PCAF	#T010028PNAF	489.00	
DX 10-17mm f/3.5-4.5 A1X Fisheye	#T0101735CAF	#T0101735NAF	669.00	
DX 11-16mm f/2.8 Pro II (77d)	#T0111628PCII	#T0111628PNII	599.00	
DX 12-24mm f/4.0 Pro II (77d)	#T012244DCX	—	399.00	
DX 12-28mm f/4.0 Pro (77d)	#T012284DCX	#T012284DXN	549.00	
FX 16-28mm f/2.8 Pro	#T01628FXC	#T01628FXN	699.00	
FX 17-35mm f/4 Pro (62d)	#T01735FXC	#T01735FXN	549.00	

▶ SIGMA AF LENSES & FLASHES		DC - for Digital SLRs Only	DG - Optimized for Digital SLRs								
H - HSM Model with Canon, Nikon, Sigma R - Rear Slip-in Gelatin Filter Slot	Canon	Nikon	Pentax	Sigma	Sony	Rebate	Price				
DC 4.5mm f/2.8 EX Circular Fisheye HSM *	#SI4528EXDCC	#SI4528EXDCN	#SI4528EXDCP	#SI4528EXDCS	#SI4528EXDSO	—	899.00				
DC 8mm f/3.5 EX Circular Fisheye *	#SI835CA	#SI835NA	—	#SI835SA	#SI835SO	—	899.00				
DC 10mm f/2.8 EX Fisheye HSM *	#SI1028EXDCC	#SI1028EXDCN	#SI1028EXDCP	#SI1028EXDCS	#SI1028EXDSO	—	649.00				
DG 15mm f/2.8 EX Diagonal Fisheye *	#SI1528DGCDF	#SI1528DGCN	#SI1528DGDGP	#SI1528DGDGS	#SI1528DGDGSA	—	609.00				
DG 20mm f/1.8 EX DF RF Aspherical (82d)	#SI2018CAF	#SI2018NAF	#SI2018PAF	#SI2018SA	#SI2018MAF	—	629.00				
DG 24mm f/1.8 EX DF Aspherical Macro (77d)	#SI2418MCAF	#SI2418MNAF	#SI2418MPAF	#SI2418MSA	#SI2418MMAF	—	549.00				
DG 28mm f/1.8 EX DF Aspherical Macro (77d)	#SI2818MCAF	#SI2818MNAF	#SI2818MPAF	#SI2818MSA	#SI2818MMAF	—	449.00				
DC 30mm f/1.4 HSM (62d)	#SI3014DCHSMC	#SI3014DCHSMN	—	#SI3014DCHSMS	—	—	499.00				
DG 35mm f/1.4 HSM (67d)	#SI3514C	#SI3514N	#SI3514P	#SI3514S	#SI3514SO	—	899.00				
DG 50mm f/1.4 EX (77d) *	#SI5014C	#SI5014N	#SI5014P	#SI5014S	#SI5014SO	\$100	399.00**				
DG 50mm f/2.8 EX Macro (62d)	#SI5028MDGCAF	#SI5028MDGCN	#SI5028MDGDP	#SI5028MDGDS	#SI5028MDDGSA	—	369.00				
DG 70mm f/2.8 EX Macro (62d)	#SI7028MDGCA	#SI7028MDGCN	#SI7028MDGDP	#SI7028MDGDS	#SI7028MDDGSA	—	499.00				
DG 85mm f/1.4 EX HSM (77d)	#SI8514C	#SI8514N	#SI8514P	#SI8514S	#SI8514SO	\$75	894.00**				
DG 105mm f/2.8 EX Macro OS HSM (62d)	#SI10528MDGCE	#SI10528MDGCN	—	#SI10528MDGDS	#SI10528MDGDSM	\$300	969.00**				
DG 150mm f/2.8 EX APO Macro OS HSM (72d)	#SI15028AMOC	#SI15028AMCN	—	#SI15028AMDS	#SI15028AMDSM	—	1,099.00				
DG 180mm f/2.8 EX APO Macro OS HSM (86d)	#SI18028AMOC	#SI18028AMCN	—	#SI18028AMDS	#SI18028AMDSM	\$150	1549.00**				
DG 300mm f/2.8 APO EX HSM (46d Rear)	#SI30028DGCDF	#SI30028DGCN	#SI30028DGDGP	#SI30028DGDGS	#SI30028DGDGSA	—	3,399.00				
DG 500mm f/4.5 APO EX HSM (46d Rear)	#SI50045DGCDF	#SI50045DGCN	#SI50045DGDGP	#SI50045DGDGS	—	—	4,999.00				
DC 8-16mm f/4.5-5.6 HSM	#SI8164556CA	#SI8164556CN	#SI8164556CP	#SI8164556S	#SI8164556SO	—	699.00				
DC 10-20mm f/4-5.6 EX HSM (77d)	#SI102046DCAF	#SI102046DCN	#SI102046DPAF	#SI102046DS	#SI102046DSM	\$50	429.00**				
DC 10-20mm f/3.5 EX HSM (82d)	#SI102035C	#SI102035N	#SI102035P	#SI102035S	#SI102035SO	—	649.00				
DG 12-24mm f/4.5-5.6 EX Aspherical HSM II	#SI122445C	#SI122445N	—	#SI122445S	#SI122445SO	—	949.00				
DG 17-50mm f/2.8 EX OS HSM (77d)	#SI175028CA	#SI175028CN	#SI175028CP	#SI175028S	#SI175028SO	\$100	569.00**				
DC 17-70mm f/2.8-4.0 OS Macro HSM TSC (72d)	#SI1770284DCC	#SI1770284DCN	#SI1770284DCP	#SI1770284DS	#SI1770284DSM	\$50	449.00**				
DC 18-35mm f/1.8 HSM (72d)	#SI183518DCC	#SI183518DCN	#SI183518DCP	#SI183518DS	#SI183518DSM	—	799.00				
DC 18-200mm f/3.5-6.3 OS II HSM (72d)	#SI1820035CD	#SI1820035CN	#SI1820035CP	#SI1820035DS	#SI1820035DSM	—	499.00				
DC 18-250mm f/3.5-6.3 OS Macro HSM (62d)	#SI1825035MC	#SI1825035CN	#SI1825035MP	#SI1825035MS	#SI1825035MSO	\$200	349.00**				
DG 24-70mm f/2.8 EX IF HSM (82d)	#SI247028C	#SI247028N	#SI247028P	#SI247028S	#SI247028SO	—	899.00				
DG 24-105mm f/4.0 OS HSM (82d)	#SI24105C	#SI24105N	—	#SI24105S	#SI24105SO	—	899.00				
DG 50-150mm f/2.8 EX APO OS HSM (77d)	#SI5015028CA	#SI5015028CN	#SI5015028CP	#SI5015028DS	#SI5015028DSM	\$150	949.00**				
DG 50-500mm f/4.5-6.3 APO OS HSM (95d)	#SI505004563C	#SI505004563CN	#SI505004563P	#SI505004563S	#SI505004563SO	\$150	1509.00**				
DG 70-200mm f/2.8 EX APO OS HSM (77d)	#SI7020028CQ	#SI7020028CN	—	#SI7020028DS	#SI7020028DSM	\$150	1249.00**				
DG 70-300mm f/4-5.6 Macro (58d)	#SI7030045CAF	#SI7030045CN	#SI7030045PAF	#SI7030045S	#SI7030045SO	\$25	144.00**				
DG 70-300mm f/4-5.6 APO Macro (58d)	#SI703004DGC	#SI703004DCN	#SI703004DGP	#SI703004DS	#SI703004DSM	—	189.00				
DG 70-300mm f/4-5.6 OS (62d)	#SI7030045C	#SI7030045N	—	#SI7030045S	#SI7030045SO	—	359.00				
DG 120-300mm f/2.8 OS HSM (105d)	#SI120300C	#SI120300N	—	#SI120300S	#SI120300SO	—	3599.00				
DG 120-400mm f/4.5-5.6 APO OS HSM (77d Rear)	#SI120400C	#SI120400N	#SI120400P	#SI120400S	#SI120400SO	—	999.00				
DG 150-500mm f/5-6.3 APO OS HSM (86d)	#SI150500C	#SI150500N	#SI150500P	#SI150500S	#SI150500SO	\$170	899.00**				
DG 1.4x EX APO Tele-Converter	#SI14XDGC	#SI14XDGN	—	#SI14XDGS	#SI14XDGSM	—	249.00				
DG 2x EX APO Tele-Converter	#SI2XDGC	#SI2XDGN	—	#SI2XDGS	#SI2XDGSM	\$50	249.00**				
DG EF-610 ST	#SIEF610STC	#SIEF610STN	#SIEF610STP	#SIEF610STS	—	\$30	135.00**				
DG EF-610 Super Flash	#SIEF610C	#SIEF610N	#SIEF610P	#SIEF610S	—	\$30	225.00**				
DG EM-140 TTL Ringlight	#SIEM140DGC	#SIEM140DCN	#SIEM140DGP	#SIEM140DS	#SIEM140DSM	—	379.00				

**SIGMA**  
18-200mm f/3.5-6.3 DG II  
OS HSM Digital Lens

- Designed exclusively for Digital SLRs
- Focus 1.5" to Infinity
- Mag. ratio: 1:3.8
- 72mm filter diameter
- Weight: 17.3 oz



**SIGMA**  
70-200mm f/2.8 EX APO  
OS HSM DG Lens

- Desirable for Digital SLRs
- Minimum focus: 4.9'
- 34-12.3" angle of view
- 72mm filter diameter
- Tripod collar
- Weight: 50.4 oz



**TAMRON**  
17-50mm f/2.8 XR VC  
LD-IF Di II Digital Lens

- Designed exclusively for Digital SLRs
- Focus 1.14' to Infinity
- Mag. ratio: 1:4.8
- 72mm filter diameter
- Weight: 1.25 lb



**Tokina**  
11-16mm f/2.8 Pro DX AT-X II  
Wide-Angle Digital Lens

- Designed exclusively for Digital SLRs
- VR (Water Repellent) coating
- Minimum Focus 1'
- Magnification ratio 1:11.6
- Weight 1.2 lb



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## BATTERY GRIPS

- Accepts 2 lithium-ion batteries to effectively double the camera's battery life (Batteries not included)
- The included AA battery holder allows you to use 6 AA batteries for added convenience (except BG-N3)
- Alternate shutter release button, main and sub command dials, and an AE-L/AF-L button are provided to facilitate shooting in a vertical orientation

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for Nikon D3100, D3200	BG-N9	#VEBGN9	\$64.95
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# CAR Window Mounts



Discounted as being for lazy photographers, a car window mount is an excellent tool for a variety of subjects from wildlife to scenics

BY THE EDITORS



In the camera support family, window mounts have been the stepchildren. While tripods, monopods and all manner of ballheads get attention, the lowly window mount is seen by many as a sort of tool for lazy photographers who can't be bothered to get out of their car. In fact, however, a window mount can be an outstanding tool for any nature photographer, and it's particularly useful for wildlife photographers using long lenses.

In this issue of *OP*, we have several articles about long lenses. A quick look at the chart in the "Supertelephoto Zooms" article will show you that these lenses are frequently large and heavy. Keeping a long lens steady is a challenge that's magnified by size and weight, as well as focal length. You're probably familiar with the minimum handholding rule, which says that 1/focal length is your minimum shutter speed, i.e., a 500mm lens has a minimum handheld shutter speed of 1/500 sec. The problem with this rule is that most people follow it blindly without realizing the importance of technique. Very few photographers can hold a long lens steady enough at the minimum handholding speed to get sharp photos, particularly in single-shot situations (see the sidebar "Techniques For Sharp Telephoto Shots"). Also, the longer the

focal length, the more you need to pad the minimum handholding speed. In theory, the rule itself takes this into account, but professional wildlife and sports photographers will tell you that the progression really isn't that linear, and longer lenses require progressively faster shutter speeds. So, in general, the longer the lens, the more difficult it is to get a sharp photo,

especially if you're not using a support. Image-stabilization systems are a tremendous benefit here, but the longer the focal length, the more you'll need to consider a grounded support system.

The window mount gives you a nice steady platform to shoot from, but if you're still unconvinced that it's little more than a device for someone who wants to shoot from a parking lot, consider this. Cars, in fact, are excellent wildlife blinds. Many animals that would bolt or hunker down at the sight of a human on foot will be completely unperturbed by the presence of an automobile. Until you get out of it, the car is little more than a rock that moves. This is a bit of an overstatement, but with some patience and taking care with your movements inside the vehicle, you'll find that you can get a lot of spectacular wildlife photos using a window mount while seated behind the wheel compared to walking around with a long lens and a tripod.

The actual mounts come in a broad

CLOCKWISE FROM ABOVE: Kirk WM-2, Manfrotto 243 with 234RC tilt head, Giotto's Car Window Mount

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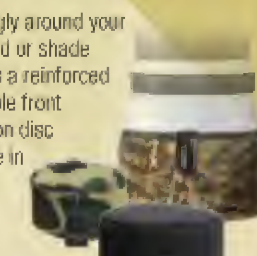
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- Available with a custom fit for most popular lenses
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Small...3.25" to 3.75"  
Medium...3.75" to 4.25"  
Large...4.25" to 4.75"  
X Large...4.75" to 5.25"

2X Large...5.5" to 6.25"  
3X Large...6.25" to 7"  
4X Large...7" to 7.75"

### Battery Pouches

- Consists of 2 Pouches
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- 4 Models: AA 4+4, DSLR 1+1, DSLR 2+2 or Pro DSLR 1+1



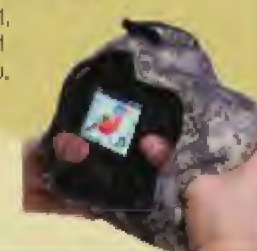
### Memory Wallets

- Lightweight waterproof
- Easy clip on tether
- 7 different colors/patterns
- 6 designs: CF6/10, SD9/15, Combo 43/66



### BodyGuard Series CB

- Same as BodyGuard plus:
- Clear plastic back
- Two plastic windows on top
- Finger access slits on the side
- Four sizes: Standard, Compact, Compact with Grip, Pro



### LegCoat Wraps (set of 3)

- Wrap around the upper leg of your tripod
- Tightly grips to your tripod so they will not slide



### BodyBag Series

- Ideal for storage or travel
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Compact with lens 5 colors  
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### RainCoat RS (Rain Sleeve)

- Lightweight, waterproof material
- Rear access to camera controls
- 7 different colors/patterns

Small— fits DSLR with lens up to 10"  
Medium— fits DSLR with lens up to 15"  
Large— fits DSLR with lens up to 21"



### RainCoat

- Lightweight, Waterproof Material
- Rear Access to Camera Controls
- Tape Sealed for Maximum Protection

Standard 20.5" 6.4oz  
fits DSLR with lens up to 100-400/400mm f5.6  
Pro 30.5" 8.6oz  
fits DSLR with lens up to 200-400/300mm 2.8



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- Manfrotto 393 Gimbal Pouch
- RRS PG Pouch
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- FlashKeeper
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- LegCoat Wraps

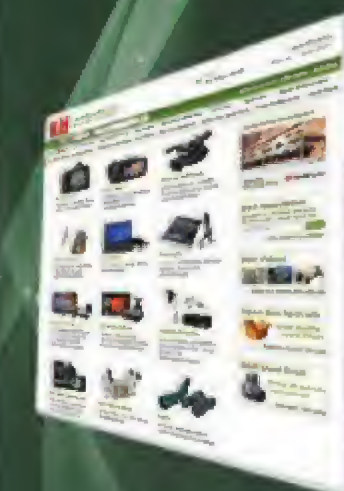
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array of sizes and capacities. Here are a few selected examples.

The **Kirk WM-2 Multi-Purpose Window Mount** is designed for serious long-lens users. It's made of solid black anodized aluminum, with rubber-covered feet to help brace the system on the inside of your car door. It can hold up to an 800mm lens. The mount folds, which allows you to use it as a low-to-the-ground tripod, as well. It has a standard  $\frac{3}{8}$ " screw to connect to any tripod head with a  $\frac{3}{8}$ " socket. Estimated Street Price: \$249. [www.kirkphoto.com](http://www.kirkphoto.com)

The **Manfrotto 243 Car Window Mount Pod with 234RC Tilt Monopod Head** will work with systems weighing up to 5.5 pounds. The head tilts 90° in either direction on its single axis. It uses a standard, reversible  $\frac{1}{4}$ "-20 mounting thread. Estimated Street Price: \$77. [www.manfrotto.us](http://www.manfrotto.us)



The **Giottos Car Window Mount** features all-metal construction, and it has a built-in head with pan and tilt control. The rubber pad protects your window, and you can use the mount with lighter-weight

camera and lens systems. Estimated Street Price: \$54. [www.giottosusa.com](http://www.giottosusa.com)  
The **Vanguard PH-304 Window Camera Mount** has a QS-36 quick-release plate and a three-way pan and tilt head. It supports camera systems weighing up to 8.8 pounds, and the clamp mechanism makes it usable on windows, as well as other possible braces like fences. Estimated Street Price: \$44. [www.vanguardworld.com](http://www.vanguardworld.com)

The **Novoflex Uniklem-42 Compact Clamp** allows you to attach it to a car window, as well as other braces. It has a standard  $\frac{1}{4}$ "-20 mounting screw so you can attach your camera directly to it, if you



## Techniques For SHARP Telephoto Shots

Anytime you're shooting with a long lens, you need to pay particular attention to your technique. Simple things like the act of depressing the shutter button can result in enough camera movement to render a photo unacceptably sharp, even if you're working within the minimum handholding rule guidelines. Here are a few simple tips for getting sharper images with longer lenses.

**1 Establish your own minimum handholding guidelines.** Starting with the minimum handholding rule of 1/focal length, do some tests to determine what your minimum is. Do this with all of your lenses. When you do the tests, shoot a variety of subjects to get

a sense of how you hold the camera differently for a moving subject versus a still landscape, for example. Be sure to evaluate the images at a high magnification to see the effect of camera shake. Keep in mind that in the excitement of spotting interesting wildlife behavior in the field, you're likely to be shakier than you were when testing.

**2 Use image stabilization with care.** Image stabilization systems have revolutionized how many photographers shoot, but they have limitations. As with the minimum handholding rule, you

should do some testing to see your personal limitations with your stabilized lenses. Stabilization tends to be a bit of a crutch, so be sure you still employ good technique as you hold the camera. Don't let your stabilized lenses make you lazy!

**3 Shoot with a motordrive.** Single shots with long lenses are notoriously difficult to get sharp. As you press the shutter button, all of the dynamics of your grip change, and it takes a moment to steady the camera. That's why you should use the motordrive whenever possible when using long lenses. This holds true for handholding, as well as using a support like a window mount or tripod. As you press the shutter and hold it, your grip and pressure on the camera all get more stable. Looking at a test sequence, you'll notice that the images in the series become progressively sharper. By the third frame, you're probably close to maximum sharpness.



The unique wooden construction of the **Berlebach Car Window Mount** makes it stand out. It clamps to a car window and provides a solid, stable platform for your camera. It comes with a  $\frac{1}{4}$ "-20 mounting screw so you can attach a camera directly, but we suggest using a head of some sort on the mount for best results. The mount can support up to 22 pounds. Estimated Street Price: \$85. [www.hpmarketingcorp.com](http://www.hpmarketingcorp.com) OP

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Go to [outdoorphotographer.com/blog](http://outdoorphotographer.com/blog) to see our web-exclusive articles on gear, Best Of Assignments, Assignment Winners, feature stories by the OP Bloggers and more.

CLOCKWISE FROM ABOVE: Vanguard PH-304, Novoflex Uniklem-42 Compact Clamp, Berlebach Car Window Mount

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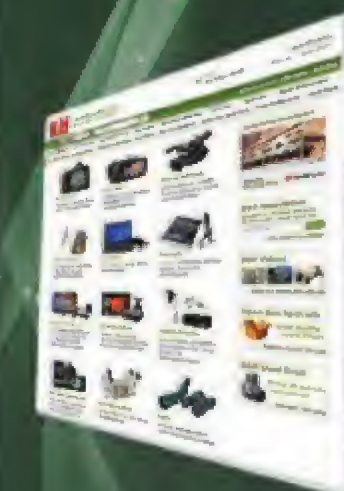


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Ed Hetherington

## A Photo Assistant

*"The image was taken while we were in Zimbabwe in the Ruckomechi Camp near Mana Pools National Park," explains photographer Ed Hetherington about this very expensive game of fetch. "In the nearby area were a lioness (the one who took the camera), her mother and one cub each. The lioness had been very actively killing buffalo near the camp. She would leave her cub with her mom to 'babysit' and would go hunting on her own. She had made few kills in the days that we were there, and instead of completely consuming the kills, she tended to eat for a while and then leave.*

*"On the morning I took this image, we came across a kill just outside our camp from the previous night that had a large flock of vultures on it. The vultures were fighting for dominance*

*and kicking up a huge cloud of dust that was perfect in the morning light. I had been using my camera on remote control and thought it would be interesting to get a ground-level view from 'inside' the flock of vultures. We did think about the lion potentially coming back, but in discussing with our guide, we didn't think she would pay attention to the camera being that she was very familiar with humans and human possessions. (Our camp was semipermanent and the kill was within 100 yards of camp.)*

*"Unfortunately, I had never seen some of the videos on the Internet that show how curious lions can be with cameras! Not long after setting up the camera, we noticed the lion approaching. When she heard the clicks from the camera as I fired the remote trigger, she decided to*

*investigate. After curiously eyeing it for a moment, she picked it up like she would pick up a cub and carried it away, holding it high in the air as if she was proud of herself. We followed her and she sat down with the camera for a few minutes before leaving it for us to retrieve. I had the remote control in my hand while I was taking this image with another camera. From the outside the camera didn't seem to have too much damage, but one of her teeth had cracked the back (through the rubber grip) and damaged the internal circuitry. It's now a souvenir on my shelf. The 16-35mm f/2.8L survived with some scratches and some sand, but otherwise none the worse for wear. I used it immediately afterward and have used it regularly since then (although I do hear some sand in there occasionally)."*

Canon EOS 7D, Canon EF 100-400mm f/4.5-5.6L IS USM

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© Hiroo Fukuda Focal length 483mm, f/9 at 1/2000 ISO 800

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